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ABSTRACT

This publication is concerned with the selection, development, and utilization of school sites in regard to both long-range and functional planning. Recommendations are presented to aid in the selection and development of more adequate and functional school grounds. Procedures illustrate approaches which may be used to determine school site requirements. Layouts of school sites showing the location of buildings, landscaping, and activity areas are included. (FS)

HIGHLIGHTS

The school site is increasingly recognized as an educational tool. Expansion of outdoor activities, increasing enrollments, and the trend toward one-story, spreadout school buildings are making new demands on the size of school sites.

Significant factors in determining site needs are: Community characteristics, population and school enrollment trends, school board policies, educational philosophy, the school curriculum, community use, evaluation of present plants, and State school programs.

A good school site promotes health and safety, is functional, economical, attractive, and adequate.

Schools should be located in an environment that stimulates love and appreciation of the beautiful in life.

Surfacing playground areas efficiently increases their attractiveness and utilization.

School planning committees may justify larger school sites in today's program by layouts, drawn to scale, which show the buildings, landscaping, and the various outdoor areas and facilities.

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Special Publication No. 7

SCHOOL SITES

Selection, Development, and Utilization

by James L. Taylor, Specialist on Planning School Buildings

Under the direction of Ray L. Hamon, Chief, School Housing Section

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE . Abraham Ribicoff, Secretary

Office of Education . . . . . Sterling M. McMurrin, Commissioner

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FOREWORD

This publication on selection, development, and utilization of school sites involves both long-range and functional planning. Logical location of school sites requires a study of the past, present, and future to determine trends in community growth, enrollments, and the educational community-service programs. More effective overall planning is done when there is cooperative effort by the school board, school officials, and other community leaders.

The purpose of this study is to assist school boards, planners, and designers in the selection and development of more adequate and functional school grounds. Procedures illustrate approaches which may be used by local groups to determine school-site requirements. School board policies, educational philosophy, and community characteristics are among significant factors which should be analyzed.

Layouts of school sites showing the location of buildings, landscaping, and activity areas illustrate how some schools and communities are utilizing school grounds efficiently. They are not standards to be copied. Each community should determine its site layouts by the characteristics of the piece of land selected and the outdoor activities to be carried on in the program.

E. GLENN FEATHERSTON, Assistant Commissioner,
Division of State and Local School Systems.

ACKNOWLEDGMENTS

This study is based on information obtained through questionnaires and conferences from representatives of State departments of education, local superintendents of schools, and school plant specialists. Members of the National Council on Schoolhouse Construction assisted by expressing opinions on trends of the characteristics of school sites. School plant supervisors in city school systems sent pertinent information on playground surfacing. Other staff members in the School Housing Section, and Instruction Organization and Services Branch of the Office of Education, were helpful in reading materials in the text and making suggestions for improvement.

Pictures of school plants and site layouts were generously supplied by State departments of education, local superintendents, architects, and landscape gardeners.

Special acknowledgments for assistance are due S. A. Abercrombie of the National Commission on Safety Education, National Education Association, Dr. Wallace M. Ruff of the University of Oregon, Dr. Dale Hayes of the University of Nebraska Teachers College, Dr. William Chase of Ohio University, and William W. Caudill of Caudill, Rowlett, and Scott, Corning, N. Y.

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I. THE SCHOOL SITE PROBLEM

One of the basic considerations for a school plant[1] program today is the grounds on which the structures are to be placed. The site is becoming increasingly recognized as an educational tool itself. This concept of the school site has not prevailed for more than a generation. However, the thinking regarding the place of the school site in the school and community program has undergone a steady evolution since the early public schools of America.

More than one hundred years ago John Orville Taylor, editor of *Journal of Education,* in his *First Lecture on Popular Education,* said:

> . . . Conceive for a few moments the location, structure, and condition of the schoolhouses you have seen while passing over the State. Are they not standing on a part of the road almost into the wheel rut where the dust and the noise of the passing carriages distract the mind? Are they not also on the point of some stony hill where all around are sharp, flinty rocks—where the summer's sun and the winter's wind have an unbroken sweep? Not a leaf of shelter, or a shrub, or flower for ornament near! . . .[2]

Even 50 years ago elementary schools in cities were commonly built on sites barely large enough to accommodate the structure itself, and 25 or 30 years ago a city block was regarded as ample for an elementary school site. One-room rural schools were frequently located on 1 acre in the corner of a farm. As athletics became a common activity, the secondary schools fared better than elementary as to size of school sites. In the early part of the century, high school sites of 5 acres were considered standard, but a few farsighted superintendents held out for 10 acres.

In the nationwide survey of school facilities, data on school sites were collected and published in 1953. Table 1 shows the percent of school sites in certain classifications according to size. It shows that approximately 82 percent of school sites included in the report from 43 States have less than 5 acres, and 70 percent of the sites have less than 3 acres. On such sites, after space has been provided for buildings and other facilities, very little area remains for playgrounds, parking, and other uses for which acreage is needed.

In the same survey, almost half of the pupils included attend schools having sites that must accommodate more than 100 pupils per acre, and 73 percent of the pupils attend schools having sites that accommodate 50 or more pupils per acre. See table 2.

[1] School plant includes the site, building, and equipment constituting the physical facilities used by a single school or by two or more schools sharing the use of common facilities.

[2] Taylor, J. Orville. *The First Lecture on Popular Education.* New York, American Common School Society, [1841] p. 66 (Third Lecture).

Table 1.—Percent of Schools, by Size of Site[1]

Type of school plant	Percent of schools by size of site							
	Less than 1 acre	1–2.9 acres	3–4.9 acres	5–9.9 acres	10–14.9 acres	15–24.9 acres	25–50 acres	More than 50 acres
1	2	3	4	5	6	7	8	9
Elementary	27.83	52.56	9.45	7.09	2.14	0.59	0.23	0.11
Secondary	9.70	20.35	14.91	23.01	13.69	10.49	5.81	2.04
Combined elementary-secondary	5.26	20.82	18.27	31.64	14.15	6.66	2.61	.59
All schools	23.86	46.56	10.90	11.16	4.37	1.98	.88	.29

[1] U. S. Department of Health, Education, and Welfare, Office of Education. *Report of the Status Phase of the School Facilities Survey.* Washington, U. S. Government Printing Office. 1953. p. 117.

Data in table 2 are more revealing than those in table 1 because a large percentage of the schools reported are small one-room schools with very small enrollments. Figures in table 2, showing pupils per acre, portray a more realistic picture of the school site situation in the country. Data in tables 1 and 2, from 43 States enrolling 20,156,045 pupils, published in 1953, represent site conditions as of 1951.

In the long-range phase of the *School Facilities Survey*, which gave many schools the opportunity to make projected construction plans in light of needs and in accordance with more satisfactory administrative units, a more promising outlook on school sites was reported.[3] The tremendous outlay of school funds for school sites, a common problem in all States, requires functional planning, design, and construction based on sound principles and techniques.

Most States suggest standards relative to minimum site size for elementary or secondary schools. The National Council on Schoolhouse Construction, a nationally recognized professional association of school plant specialists, also suggests minimum sizes in acres by types of schools, with variations in accordance with the number of pupils enrolled.[4] These minimum standards, as recommended by the Council, are reported on page 40.

In response to the question, "What are the trends in your State relative to size, location, improvement, and utilization of school sites?" directed to State school plant specialists in 1957, the following reply is typical:

. . . let me say the size of school sites is increasing consid-

[3] U. S. Department of Health, Education, and Welfare, Office of Education. *Report of the Long-Range Planning Phase—School Facilities Survey.* Washington, U. S. Government Printing Office. 1956.

[4] National Council on Schoolhouse Construction. *Guide for Planning School Plants.* The Council, George Peabody College for Teachers, Nashville, Tenn. 1958. 254 p.

Table 2.—Percent of Pupils Per Acre, by Size of Site[1]

Type of school plant	Percent of pupils, by size of site (acres)								
	Less than 10	10–24.9	25–49.9	50–74.9	75–99.9	100–149.9	150–199.9	200–250	More than 250
1	2	3	4	5	6	7	8	9	10
Elementary	2.88	9.48	14.35	11.69	9.67	13.95	8.55	7.01	22.42
Secondary	2.25	6.46	13.67	11.62	11.25	12.28	7.44	6.30	28.73
Combined elementary-secondary	1.71	8.70	22.25	18.02	12.47	13.35	6.34	4.65	12.51
All schools	2.46	8.69	16.22	13.28	10.69	13.47	7.77	6.27	21.15

[1] U. S. Department of Health, Education, and Welfare, Office of Education. *Report of the Status Phase of the School Facilities Survey.* Washington, U. S. Government Printing Office. 1953. p. 117.

erably over our minimum standards which are the same as the National Council on Schoolhouse Construction recommendations. Relative to utilization, we try to encourage towns to use sites for community use as well as student use. The improvement of sites goes hand in hand with the general use. The sites of plants which we find used most extensively by communities are generally those which are the best developed and conveniently located.[5]

[5] Sanborn, George E., Associate Consultant, School Building Section, State Department of Education, Hartford, Conn. 1957.

Many schools are beginning to use the campus-type plants instead of massive structures. Outdoor activities in both elementary and secondary schools are increasing and, therefore, making new demands on school grounds. In many communities adults and young people use school grounds after school hours. All these factors are influencing school boards to select larger sites. Just how much land is needed is a question which local communities should attempt to answer only after careful study.

II. DETERMINING SITE NEEDS

Before determining school site needs, a thorough study should be made of the community characteristics, population trends, school board policies, educational philosophy, school curriculum, evaluation of present school plants, plans for expansion, and State regulations on reorganization and long-range plans.

Community Characteristics

Since the school plant may well serve 40 to 50 years, the study must include future as well as present needs. A planning committee must therefore acquire knowledge of trends and future development of the community for which it plans. It would be well to study the community's history, to determine its pattern of growth in the past. Has it grown steadily into a thriving industrial center? Or has it declined in population? If the community is growing, in which direction are the residences being constructed? Closely related to the historical study and of special significance in a school site study is the geographical study of the community.

Another phase of community study important in the location of schools and development of school sites is the development of the educational program. What were its beginnings? How well have people supported education? Other inquiries of interest would be the district's original boundary, changes in boundary, and community resources for instructional materials. The school board should concern itself with physical growth of public buildings, homes, and parks, with cultural development, and civic organizations. Sources of such information are numerous in typical communities, including newspaper files, local records, minutes of official bodies, maps and documents, letters and memoirs, analysis reports, and personal interviews. It would be well to include some of the long-time residents on a school site committee.

Population Trends

A study of population trends is necessary in planning a community's educational program. To locate a school the board should have data not only on present enrollments but projection of enrollments at least a few years in the future. It would be helpful also to know how the people live and make a living. People's knowledge, industry, and ingenuity determine how well natural resources, whatever they may be, can be used in the instructional program.

In studying population trends in a community, certain

variables must be considered. Live births, mortality, migration, number of pupils attending parochial schools, uneducables, private special classes, and promotion policies operate differently in each community to influence future enrollments. Enrollment projection, sometimes considered a difficult task, is done in many communities by local people with assistance of a consultant from the State Department of Education or a college or university.

To make a decision on the location of a school, the board needs information provided in various types of maps. A geological map of the whole area showing earth formations, relief features, and undeveloped areas may be necessary in the study of the present and future population. Other maps which should be provided include information on the location of existing schools, transportation facilities, streets and highways, new residential developments, and location and distribution of industrial and recreational development.

Dot maps showing density of pupil population by residences are essential in determining attendance areas. Such maps should include circles whose radii indicate one-way travel distances for pupils who live on the fringe. In estimating future population for an area it would be well to consult real estate firms and utility companies on residential permits and service connection.

School Board Policies

The board of education is the legislative and policy-forming group and the superintendent the chief executive officer of a school system. This widely accepted concept, according to Herrick [1] and others, places the following responsibilities on the board: (1) To formulate and adopt general policies for the operation of the schools, (2) to select a competent superintendent and hold him accountable for the proper execution of the board's policies, (3) to furnish the superintendent of schools with the necessary staff, buildings, equipment, and funds to put the board's policies into effect, and (4) to evaluate the effectiveness with which the board's policies are being carried out in the operation of the school system.

In determining site needs, a planning group should study the board's policies. For example, if transportation is to be provided, what are the board's rules relative to walking distances of pupils? Some schools do not furnish transportation for elementary pupils who live within a radius of three-fourths of a mile of the school; for junior high pupils, 1½ miles, and for senior high, 2 miles. Such regulations will naturally influence recommendations on school sites. Some schools are trying to avoid large elementary school plants by planning two or more buildings on the same campus or by constructing small schools on a neighborhood basis. Some school systems plan for two or more medium-sized secondary schools in different sections of the city rather than building one large school plant where pupils have a tendency to become a part of an assembly-line education and miss individual guidance, instruction, and participation in activities more common in medium-sized schools.

In some localities the school boards cooperate with municipal recreation commissions in purchasing and developing contiguous property for joint use. There is a significant trend toward using both elementary and secondary facilities for recreation and education purposes.

In 1945–46 there were over 103,000 school districts in this country, and in 1956–57 there were only about

[1] Herrick, John H.; Clapp, Wilfred; *and others*. *From School Program to School Plant*. New York, Henry Holt and Co. 1956. p. 12–13.

54,000.[2] The trend in most States is definitely to reorganize and thereby reduce the number and increase the size of local school units. A school site committee should know the local board's reorganization policy. Are boundaries pretty well fixed, or is there a good chance that they may be expanded?

Educational Philosophy

One of the first prerequisites to an improved school plant is a clearcut statement of the school's educational philosophy. If, for example, the people believe the school must identify itself with the community it serves and utilize its resources, the school plant must be built with these needs and resources in mind. Two major questions are involved: What are the legitimate purposes of the school in the community, and whom shall the school serve?

The Educational Policies Commission list the following objectives or purpose of education in the American democracy under four main headings:

(1) *Self-realization.*—The educated person has an inquiring mind, speaks the mother tongue, reads efficiently, solves problems, is a skilled listener and observer, has basic health facts and habits, likes sports and other pastimes, has mental resources for leisure time, and has a reputable character.

(2) *Human relationship.*—Respects humanity and friendship, cooperates with others, observes the amenities of social behavior, appreciates the home, conserves family ideals, is skilled in homemaking, and maintains democratic relationships.

(3) *Economic efficiency.*—Work is satisfying, understands requirements for jobs, selects and succeeds in a vocation, improves in efficiency, appreciates social values of work; plans economics of own life; develops standards of expenditure; is an informed and skillful buyer, and safeguards his own interests.

(4) *Civic responsibility.*—Sensitive to disparities of human circumstances; acts to correct unsatisfactory conditions; seeks to understand; has defense against propaganda; has tolerance, regard for national resources; contributes to general welfare; is a world citizen; respects law; is economical, literate; accepts civic duties; and has unswerving loyalty to democratic ideals.[3]

In addition to these general objectives, a school system should establish more specific goals for elementary and secondary schools. The ten imperative needs of youth as listed in *Education for All American Youth* is a sample of specific goals for secondary schools.[4] These imperative needs are broken down into specific typical activities in the publication *The Secondary School Plant.*[5]

The second question of major importance, that is, whom shall the school serve, must be decided in each community. The school program can be broad and extensive, or narrow and restricted. Such questions as—Shall the school have a kindergarten, a community college, and an adult education program?—are of particular interest. If these services are provided, how comprehensive should they be? School systems which have formulated their

[2] Fitzwater, C. O. *Organizing Districts for Better Schools.* Washington, U. S. Government Printing Office, 1958. (Office of Education, Bulletin 1953, No. 9.) p. 1.

[3] Educational Policies Commission. *Education for All American Youth.* Washington, National Education Association, 1944; revised 1952. p. 7.

[4] Ibid., p. 225–26.

[5] Taylor, James L. *The Secondary School Plant—An Approach for Planning Functional Facilities.* Washington, U. S. Government Printing Office, 1956. (Office of Education, Special Publication No. 5.) p. 12–14.

philosophies through deliberate and democratic procedures involving both professional school people and lay citizens have made a fine contribution to the cause of education in their community. School systems that have not had occasion to study and formulate educational philosophies would do well, at the opportune time, to engage both professional and lay citizens in a detailed study of the objectives of education in their communities.

School Curriculum

The chief function of the school grounds is to serve as a part of the total school plant, to facilitate the instructional program. The grounds are an extension of the indoor classroom for outdoor physical education and recreation, a laboratory for science, an amphitheatre for dramatics, public speaking, and music. Such facilities will, of course, vary from one school to another. The site survey team has the responsibility to find out the nature of the outside activities of the school curriculum for the future as well as the present before recommending to the board space and facility requirements. There is much discussion today on revision and/or expansion of the curriculum especially in secondary education.

Just as planners of school buildings must know the school activities to be carried on to determine space and equipment requirements, so must the site committee know the kind and nature of outdoor activities. These are determined by age and number of pupils, the philosophy of the school relative to education, and outdoor experiences. The climate is another factor which influences outdoor activities.

The school site definitely influences the type of program which is carried on outside the school building. A spacious, well-planned school site, for example, encourages competitive group activities, such as softball and baseball. On the other hand, a small campus may discourage, or even prevent, any possibilities of such sports. It must be disheartening for a physical education instructor and the pupils when there is not sufficient area for vigorous games such as softball, baseball, and football. Activity areas for various uses of grounds, including types of game requirements, are included in section *V, Planning and Developing the School Site.*

Evaluation of Present Plants and Proposed Sites

Before making recommendations on school plant needs, it is necessary to make an evaluation of existing facilities, including an appraisal of sites. To do this, there must be some type of criteria for use in evaluating facilities. At the time of inspection attention should be focused upon the various possible uses of each facility, upon its advantages and disadvantages for each such use, and upon the possibility and approximate cost of the necessary alterations or additions.

In the nationwide *School Facilities Survey* in 1951, States classified their school plants as "satisfactory," "fair," or "unsatisfactory." These definitions may be found in *The Secondary School Plant*, published by the Office of Education in 1956.[6]

Experienced school building specialists do not rely heavily on score cards in evaluating school plants. However, they do use an outline or checklist possibly suggested by items in such instruments. In the use of school building rating cards, subjective judgments enter, and two per-

[6] Ibid., p. 2–3.

sons evaluating a plant may come up with different scores. Another obvious weakness is that any one observer looking at the plant on two different occasions may assign quite different scores. The most serious weakness in the use of formal score cards is that the total score loses much of its meaning by the process of adding items which are not of like character. Such totals are not very meaningful except in a general way. The score card does, however, provide a useful guide to the orderly inspection of a plant even by experienced observers, and it provides a means of making very rough comparisons of one plant with another.

Numerous score cards for rating school plants have been published to aid survey committees in collecting pertinent information. (Samples of such rating instruments may be found in the appendix.) Another type of evaluation instrument deals with the purposes to be served and implications for facilities needed. Landes and Sumption [7] developed such an instrument which can be used by lay citizens. However, to use it effectively, the scorer should be reasonably familiar with the educational program. It is based on functional characteristics of the school plant, including adequacy, suitability, safety, healthfulness, accessibility, flexibility, efficiency, economy, expansability, and appearance. Each of the ten items outlined in this citizens' workbook opens with a breakdown of desirable characteristics of school sites to be considered in evaluating the total plant. References on site, such as size, environment, soil, location with respect to residences of pupils, availability of utilities, development of the various work, play, parking, and landscaped areas, are also included.

People who use school plants should assist in their evaluation. For example, the custodians and matrons should be consulted about maintenance procedures. In efficiency of classroom provisions, room teachers may well contribute to worthwhile plans. Since evaluation of proposed school sites enters into long-term planning as well as present functional planning, a committee should anticipate change and expansion of the school program. Will the site adequately provide for expansion of science and outdoor study, vocational education, physical education, intramural and intersectional sports, and parking? Special attention should be given to the convenience and safety of pupils. Travel distances should be reasonable and the routes of travel as free as possible of hazards of all kinds. Attention should also be given to the wholesomeness and attractiveness of the neighborhood.

The task of appraising school sites should be planned in light of local community needs. Careful planning, which defines policies and procedures, should include preliminary steps and criteria. After these have been selected, the next logical step is to determine who will make the appraisal. Then prepare a clear statement of what is expected as outcomes of the appraisal. Many communities use lay citizens as well as building experts on such committees. Selecting committees is a time-consuming task, but, if well done, usually results in good planning. The committee members must become familiar with the plant, including some important details and building standards. It would be well to supply them with pertinent literature in the field, since some will be interested in doing research. They should also be given opportunity to discuss pertinent questions in group meetings. A sample school plant rating scale might be a good basis for the discussion. A site-appraising committee should actually visit schools and prospective sites, so that they can actually traverse the land and make observations for the final report. To be most effective, final recommendations should include discussion

[7] Landes, Jack L., *and* Sumption, Merle R. *Citizens' Workbook for Evaluating School Buildings.* New York, Harper & Bros. 1957. 92 p.

of major items, such as area, play and instructional layouts, landscaping, drainage, parking facilities, traffic hazards, and environmental conditions.

The site committee must give consideration to the matter of cost, although the price of the land usually represents a small fraction of the total cost of the plant.

State Departments of Education

State departments of education, realizing the urgency for assistance in planning and constructing school plants, are strengthening their divisions of school plant services. Local school systems in many communities of all States take advantage of school plant services of the State department of education. There is a wide range in scope and type of services rendered or controls exercised by the various States. The total range of services extends from occasional consultative to complete services covering the total school plant from the first steps through planning, construction, and plant management problems. However, no one State seems to be able to provide all such services. Some States aid local school districts in surveys and long-range planning. Under this pattern local school systems submit their long-range programs with proposed building construction priorities for State review and approval. This gives local school systems an opportunity to coordinate their plans with overall State programs for reorganization of administrative units. Without such working relationships with the State and adjoining districts, grave and expensive mistakes may be made in the location of schools. In a recent study of State school plant services, it was found that 34 States approved new school sites for adequacy. In miscellaneous areas of school plant services, 6 States assist in developing site layout master plans, and 21 States assist occasionally in such surveys upon request.[8] Thus, more than one-half of the States give some assistance in appraising and selecting school sites.

[8] Viles, N. E., *and* Hamon, Ray L. *State School Plant Services.* Washington, U. S. Government Printing Office. 1956. (Office of Education Misc. No. 26), p. 27–28.

III. THE SCHOOL SITE IN THE PROGRAM

Adequate school grounds are required if schools are to meet the challenge of society to develop well-rounded citizens. Today's curriculum includes many activities outside the buildings, such as physical education, outdoor study of nature and conservation; and outdoor assemblies, demonstrations, and exhibitions in music, dramatics, and art. Good school grounds, well kept and efficiently utilized, are an excellent means of public relations.

Physical Education and Recreation

Planners of school plants should keep in mind the functions of various phases of the curriculum. In physical education the major functions commonly accepted are to promote the health and physical development of pupils, to help each boy and girl develop useful physical skills and socially useful practices, and to enjoy wholesome physical recreation. To carry out such a program, pupils must participate in a great variety of physical activities. What are some of the activities in physical education which may be carried on on the school grounds?

In elementary schools, the physical growth and development of children vary according to age. For young children activities tend to be carried on as individuals, but as children get older they play more as groups and teams. Some basic activities, such as walking, running, jumping, skipping, hopping, climbing, pulling, throwing, and catching, are emphasized in the physical education activities of younger children. Changes in activity patterns are frequent with young children because of the shorter interest span and lack of endurance. The games of older children include and repeat the same activities, but emphasize the development of skills and are carried on for longer periods.

One of the basic needs for children is adequate play space. Typical activities, listed above, imply space on grounds with area, contour, and surfacing suitable for vigorous activity for groups. Elementary schools need some hard-surfaced areas that can be used during the time the grounds are wet or snow-covered. (Discussion of surfacing may be found in section V.)

Elementary children in the upper grades need outdoor space for basketball and volleyball courts, jumping ropes, softball and touch football fields, and space for track and field events. Children in the lower grades also need outside space for games with balls, jumping ropes, and relays.

Playground apparatus should be varied in kind and in sufficient quantity to avoid competition in use. It should be strong, durable, and free of safety hazards, such as rough or splintered surfaces or needless projections and

Dodge-ball on adequate play space, with the woods as a background.

NORTH GADSDEN SCHOOL, GADSDEN, ALA.

Spacious grounds for play where trees were preserved.

thin edges. Apparatus should be anchored in concrete which is below the ground surface. Brightly colored paints used on equipment adds to its attractiveness, stimulates use, and helps to prevent accidents.

The program in secondary schools is broad and varied. Pupils may be instructed in both large and small group team games, such as football and soccer, speedball, softball, volleyball, and basketball; individual-dual sports, such as horseshoes, table tennis, archery, handball, golf, tennis, and bowling; rhythmic activities such as folk, square, and contemporary dancing; and in water and winter sports, where feasible. Pupils are also instructed in stunts, tumbling, and gymnastics; in outing activities such as camping, fishing, and hunting; and in other interesting developmental activities. It is important that every boy and girl participate in sports and games in school which may carry over to life. Adaptations should be made for handicapped and other exceptional children.

Intramurals include participation in sports and games between units within the school. These voluntary activities are carried on during and after regular school hours and offer opportunities to use the skills, attitudes, and understandings developed through the instructional program.

Interscholastic athletics for boys feature competitive games, such as basketball, football, baseball, and softball, track, and field events. Some schools confine girls' interschool athletic activities to invitational events, field or sport days, and the like. Other schools sponsor certain competitive girls' sports, such as basketball, volleyball, and field hockey.

The modern program of physical education in secondary schools has a great variety of activities. It is not proposed here that all schools will attempt to provide space and facilities for all the activities listed above, but such a list may be used as a basis for selecting facilities and spaces

LINCOLN-WAY_COMMUNITY HIGH SCHOOL, NEW LENOX, ILL.
Archery for high school girls on 70-acre site.

to fit the local program. Many activities listed in the secondary physical education program imply need for large areas and varied facilities. A rather complete discussion of areas and facilities required for certain common sports may be found in a recent publication by the Athletic Institute,[1] such as field-game areas, court-game areas, tennis courts, archery facilities, bait-casting, horseshoe courts, shuffleboard courts, lawn bowling alleys, handball courts, ice-skating, facilities for skiing, a golf course, and swimming pools. (Dimensions for such areas are given in tabular form in section V.)

[1] Athletic Institute. *Planning Facilities for Health, Physical Education, and Recreation.* The Institute, 209 South State St., Chicago 4, Ill. 1956. 154 p.

MEADOW DRIVE ELEMENTARY SCHOOL, MINEOLA, N. Y.
Play area convenient to building.

Planning for play and recreation is equally important for rural schools, and should not be treated lightly with the idea that rural children and young people have many opportunities for outdoor play. Rural children usually have a limited amount of time after school to play; and because of the distances between homes and the school, they are often denied the opportunity of playing with other children. For these reasons it is particularly important that the school's resources be used to the fullest in the physical and social development of the child.

Interschool athletics have, in many instances, received a preponderance of attention to the detriment of a well-planned and administered physical education program. In general, athletics should be a part of the physical education programs. However, the extent to which the site development plan provides special facilities for interscholastic athletics must depend upon the emphasis placed upon the program in the local situation. Interschool athletics where large crowds must be handled create problems for the school board. Extra parking space must be provided and arrangements made to move traffic rapidly without damage to play areas. Facilities are required for sale and collection of tickets and sale of refreshments, public address, team rooms, toilets for pupils and spectators. These special facilities may be in a special stadium, fieldhouse, or park on the grounds.

Community leaders, working together in many areas, are developing community recreation programs for both children and adults. They are finding that school facilities properly planned and designed are logical centers for such programs with elementary schools serving neighborhoods and secondary schools a larger geographical area. Spacious, well-planned school grounds need not be idle after school and during vacation. Children, youth, and adults can utilize areas and facilities designed for regular school use, thus assuring the taxpayer better returns on his tax dollar invested in school plants. Many parents and educators are concerned about the way pupils spend their vacations. Why not use the school facilities more months in the year? Many believe the school term should be extended in a program rich in recreational experiences. There are many others who believe that opportunities offered during the regular school year might be extended into vacation periods.

As life becomes more crowded and complex the simple outdoor activities that can be carried on in natural settings

ELEMENTARY SCHOOL, MIAMI, FLA.

Wholesome recreation.

LINCOLN-WAY COMMUNITY HIGH SCHOOL, NEW LENOX, ILL.

Girls practicing precamping activities on school grounds.

become increasingly worthwhile. Hence, participation in camping and outing activities is growing. Many schools are teaching the skills of shooting and handling firearms, casting, hiking, camping, and other outdoor sports. Such schools are providing facilities on the regular school site for instruction in basic skills and knowledge of outdoor activities. Additional experiences may be gained by students at school, organizational or private camps, or through family vacations and other forms of recreation.

The growing population and the mobility of people in all States are causing congestion in most suburban communities. People, both young and old, seem to have more leisure than ever before. Work hours per week are becoming shorter, due to automation and increased number of workers. Children and young people do not have chores at home to occupy a part of their leisure as was true a generation or two ago. How to use this increased leisure is a serious problem in this country. Many school systems are not only providing wholesome recreational opportunities for young people today but preparing them for leisure in adulthood, even after retirement.

The problem of juvenile delinquency is complex. The causes in each individual case are probably multiple. Community-wide effort on the part of many agencies and individual citizens is required to minimize conditions conducive to delinquency and to strengthen preventive measures. School administrators and teachers have a considerable role in such community action. School personnel may contribute to the reduction of delinquency in several ways, including: (1) The teaching of recreation skills; (2) the encouragement of interests in satisfying, creative, and health-giving activities; (3) the provision of recreation leadership; and (4) the promotion of maximum utilization of school facilities for school-community recreation purposes. However, these are significant responsibilities of the school for helping meet the recreation needs of all community members—because recreation is a basic human need and a fundamental community service. The possibility that good school and community recreation programs may assist in solving the delinquency problem adds to their value. Commissioner A. W. Ford of the Arkansas State Department of Education said in a staff meeting in 1957 that "availability of school facilities to children and young people after school hours and during vacations might help solve the juvenile delinquency problem in some communities."

Many new school plants include recreation rooms and outdoor areas for dances and other social activities. Some buildings are so designed that outside doors open onto adjacent courts which may be lighted and used for social recreation at night.

Community activities on the school grounds may include sports and games for children, young people, and adults. Facilities for such programs need not include extra areas but may be the same layouts on the grounds for similar regular school activities. Such multiple-use of space and equipment increases the percentage of utilization and appeals to the average taxpayer and patron. It also encourages participation on the part of many people who tend to be spectators and thus fail to get needed exercise and wholesome enjoyment which comes from active engagement in sports, social games, dances, and other recreational activities.

A site-survey committee should secure information relative to community recreation programs and plans for future programs in order to determine site needs. It should also secure data on facilities available in the community, including parks, ball diamonds, gymnasiums, auditoriums, multipurpose rooms, and libraries. Such information may assist the school board to save the taxpayers added expense.

HIGH SCHOOL, NORMAN, OKLA.

Here is an interior corridor which opens into the social court.

Outdoor Education

Educators have long believed that the more direct and meaningful the experiences the more probable it is that learning will take place. Realizing that all knowledge is not gained within the four walls of the school building, much of today's school program in many areas, when the weather is suitable, is carried on outside the school building. School grounds and adjacent areas, therefore, become outdoor classrooms and laboratories for learning experiences in science, conservation, agriculture and gardening, and in other subject matter fields.

SCIENCE.—In this scientific age, for effectiveness in occupation and in the functions of citizenship, everyone needs basic scientific understanding, skills, and attitudes. Not only is instruction in science desirable for all pupils, but the Nation has urgent need for well-trained scientists, engineers, and technicians.

Many scientific activities in the instructional program may be carried on outside the school building, such as caring for animals and plants; collecting and preparing specimens; examining specimens and other materials; improvising experiments, demonstrations, and illustrations; interviewing citizens of the community; observing objects and experiments; preparing class and community exhibits; reporting on experiences and plans; taking field trips and excursions; and testing consumer products.[2]

Many science teachers recommend that science rooms be placed on the ground floor with outside doors providing ready access to the grounds. Such an arrangement, they say, encourages the use of the out-of-doors as an extended laboratory. The science teacher is peculiarly fortunate in being able to use the real things of the environment in his work, thus removing learning from the vague, abstract level of verbalization. Outside the buildings his pupils may study plants, animals, rocks, and soil in their setting. Some resources are brought into the science laboratory for examination, experimentation, and detailed study.

In the selection of a school site for a new building, due consideration should be given to the potential contributions the site and its surroundings can make to the teaching of science. The availability of wooded areas, streams, experimental farms and gardens, natural formations, and other similar resources should be investigated and considered in the final decision. Science teachers should point out to school officials and planners their views concerning the merits of one site in comparison with others.

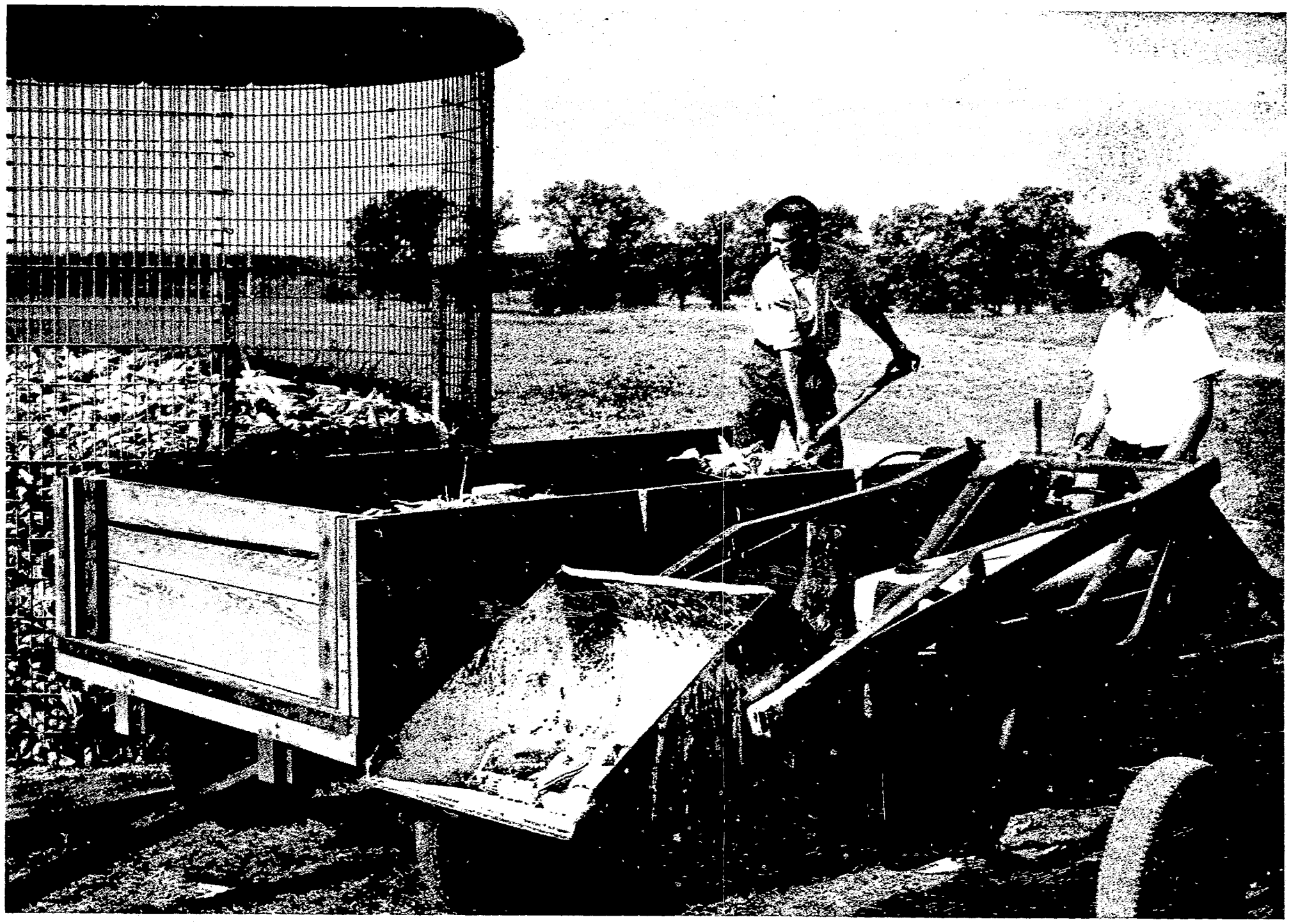
CONSERVATION.—Another type of outdoor study which requires adequate school site is that of conservation of natural resources, as illustrated by the following:

> . . . In some sections of the country a whole generation of children are being educated so that they can make intelligent use of our natural resources. In some elementary schools, conservation education is a part of the children's learning experiences in every grade. In others the emphasis is given in one or more grades. Development of conservation concepts is not confined to a single unit, grade, or level of education. Such concepts often permeate the entire educational program.[3]

In some elementary schools children learn about conservation by planting trees, seeding grass, and building

[2] Johnson, Phillip G. *Science Facilities for Secondary Schools.* U. S. Department of Health, Education, and Welfare, Office of Education. Washington, U. S. Government Printing Office, 1952. (Misc. No. 17.) p. 2.

[3] Bathurst, Effie G., *and* Hill, Wilhelmina. *Conservation Experiences for Children.* Washington, U. S. Government Printing Office, 1957. (Office of Education, Bulletin 1957, No. 16.) p. 1–2.



LINCOLN-WAY COMMUNITY HIGH SCHOOL, NEW LENOX, ILL.

Storing corn on school grounds, where it was raised by Future Farmers of America members.

nature trails. Talking about conservation and making posters about it won't do much good while the grounds are washing away. The best way to teach conservation is from outdoor environment, studying soil by experimenting with various types of crops, terracing ground to stop soil erosion, and fertilizing soil with leaf mold. Children in some schools of certain Western States plant trees for shelter belts to help check wind and prevent soil erosion.

Fortunate indeed are children who have school grounds where conservation can be practiced. Many teachers wish for more acreage where children might do such things as learn to plant trees for beauty and for profit.

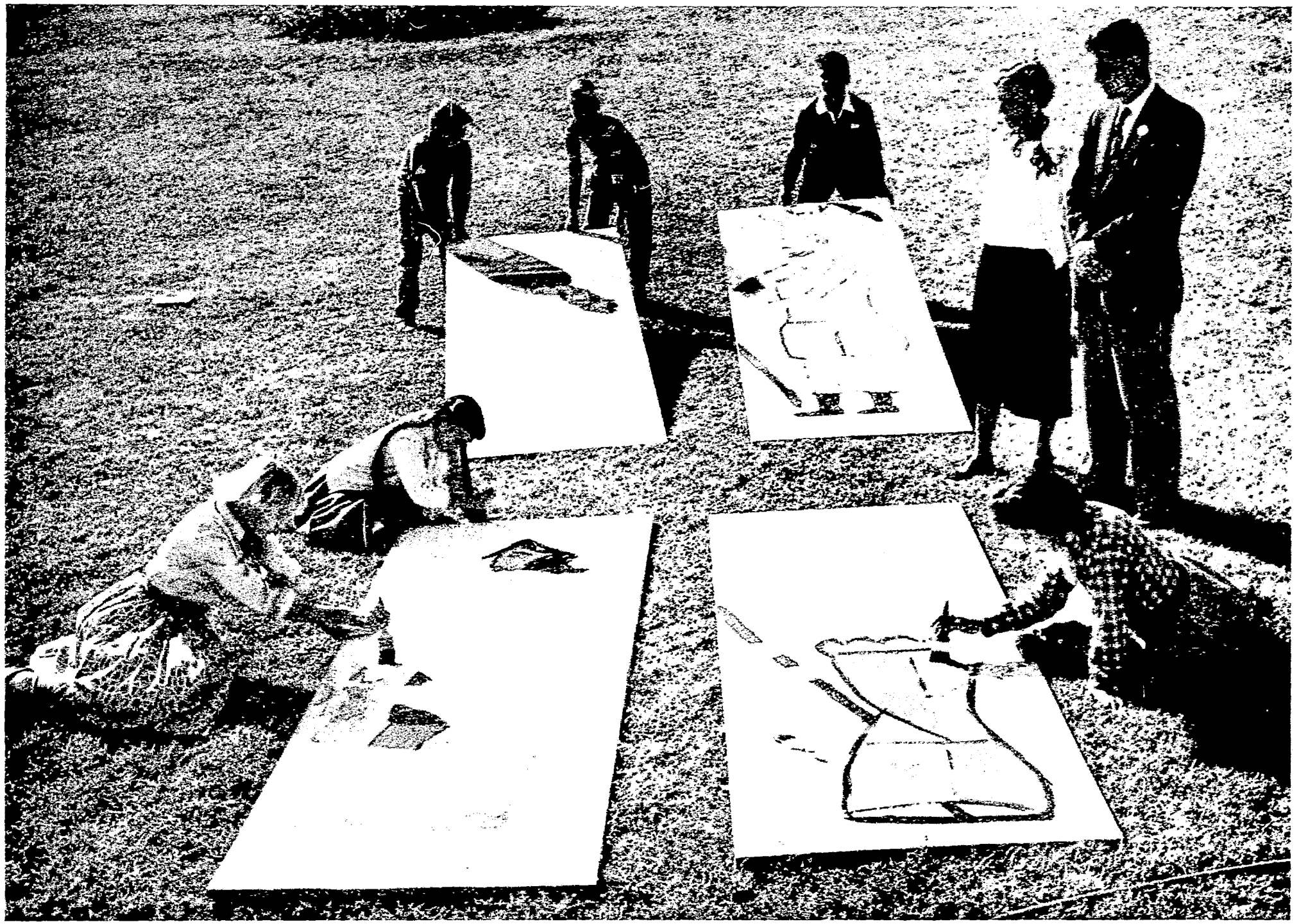
AGRICULTURE.—Many of the major activities carried on in an agricultural program of a school require large school grounds. The following are some typical activities requiring outside space: Study, judging and practicing methods of raising livestock, fruits, and vegetables; preparation of meat, poultry, and dairy products for market or storage; storing, servicing, and reconditioning farm tools and machinery; participating in local, State, and national agricultural organizations, such as Future Farmers of America and adult farmer groups. In one school the FFA cultivated 40 acres of the school grounds to grow crops for the purpose of experimentation and also to raise funds to develop a 7-acre wooded area as a recreation area. Agricultural students may test the soil to determine deficiencies and add the necessary chemicals to build it up. They also study and sometimes remedy the problem of erosion of the grounds. In these activities they are learning about contour plowing and conservation of the soil.

Pupils in some schools plant and cultivate vegetables, such as radishes, turnips, lettuce, tomatoes, peas, beans, cabbage, carrots, and corn. These may be used in the school-lunch program or sold to raise funds for financing improvement programs.

The agricultural program is usually housed in a wing of the main building or in a separate building. Since the pupils will be studying and repairing farm machinery, the agriculture facilities should be located near a side entrance to the grounds. The shop should have double doors, so that large farm machinery can enter from a side street without crossing play areas.

OTHER SUBJECT MATTER FIELDS.—In addition to outdoor study involving the natural environment and resources, pupils sometimes may go to the grounds for measuring distances and areas to illustrate problems in mathematics. Pupils sometimes plan and lay out courts and other playground areas as an assignment in mathematics. Teachers in sections of the country where the climate will permit may take pupils out of doors for reading, dramatics, writing, or freehand drawing. These activities are often conducted in "outdoor classrooms," just outside the building, or in nearby shady nooks suited for study and practice. Pupils thus learn to enjoy being out of doors and to use it for study, meditation, and experimentation.

No attempt has been made here to enumerate all activities carried on in outdoor study, but merely samplings are mentioned in certain important fields to illustrate a procedure for studying a local program and implications and criteria for site selection and development. Resources such as native trees and shrubs, natural streams, lakes, ponds; cultivated areas, such as fields, gardens, and orchards; native grass areas, quarries, or other evidences of underlying soil features, should be considered in site selection and when present in a site should be preserved in site development.



ELEMENTARY SCHOOL, MIAMI, FLA.

Drawing class on school lawn.

Outdoor teaching area.

Driver Education

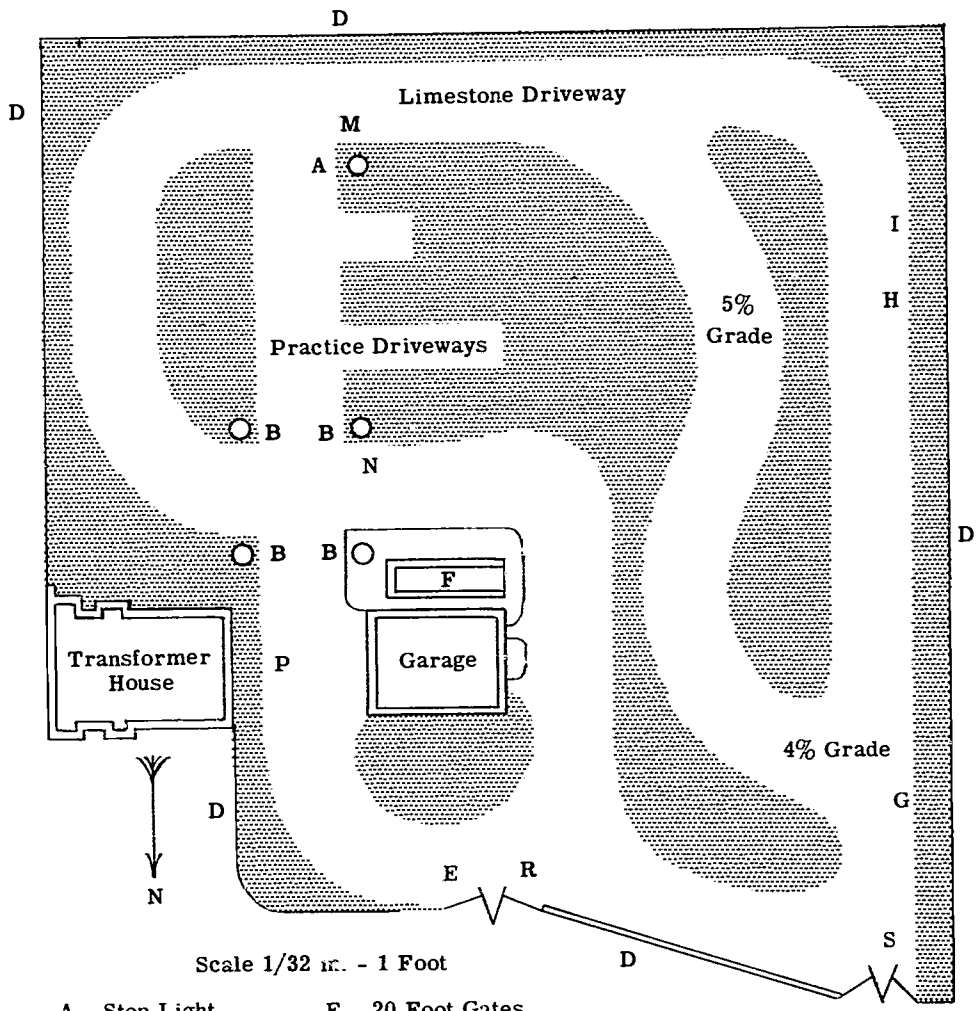
Against the background of the new highway expansion program and the persistently high toll taken by traffic accidents, secondary schools are accepting more and more the responsibility of instruction in driver education. More than 11,000 high schools now give this instruction, and 14 States provide special financial support to high schools offering the program.

Many schools are developing curriculum materials in driver education, providing cars for study and practice, and recruiting teachers in this important field. Young people are eager to learn about traffic and how to drive automobiles.

Driver education comprises both class and practice driving instruction. The classroom phase stresses good attitudes about driving based on knowledge and understanding of traffic laws and regulations, driver characteristics, road and weather factors, automobile maintenance, and the skills of driving. But students must have instruction and guided practice in operating an automobile to learn to be safe and successful drivers. Before going into busy streets, however, teachers should give students certain basic instruction and practice *away from traffic*. It is highly desirable that the early lessons be given on school grounds or nearby vacant lots available to the school for this purpose.

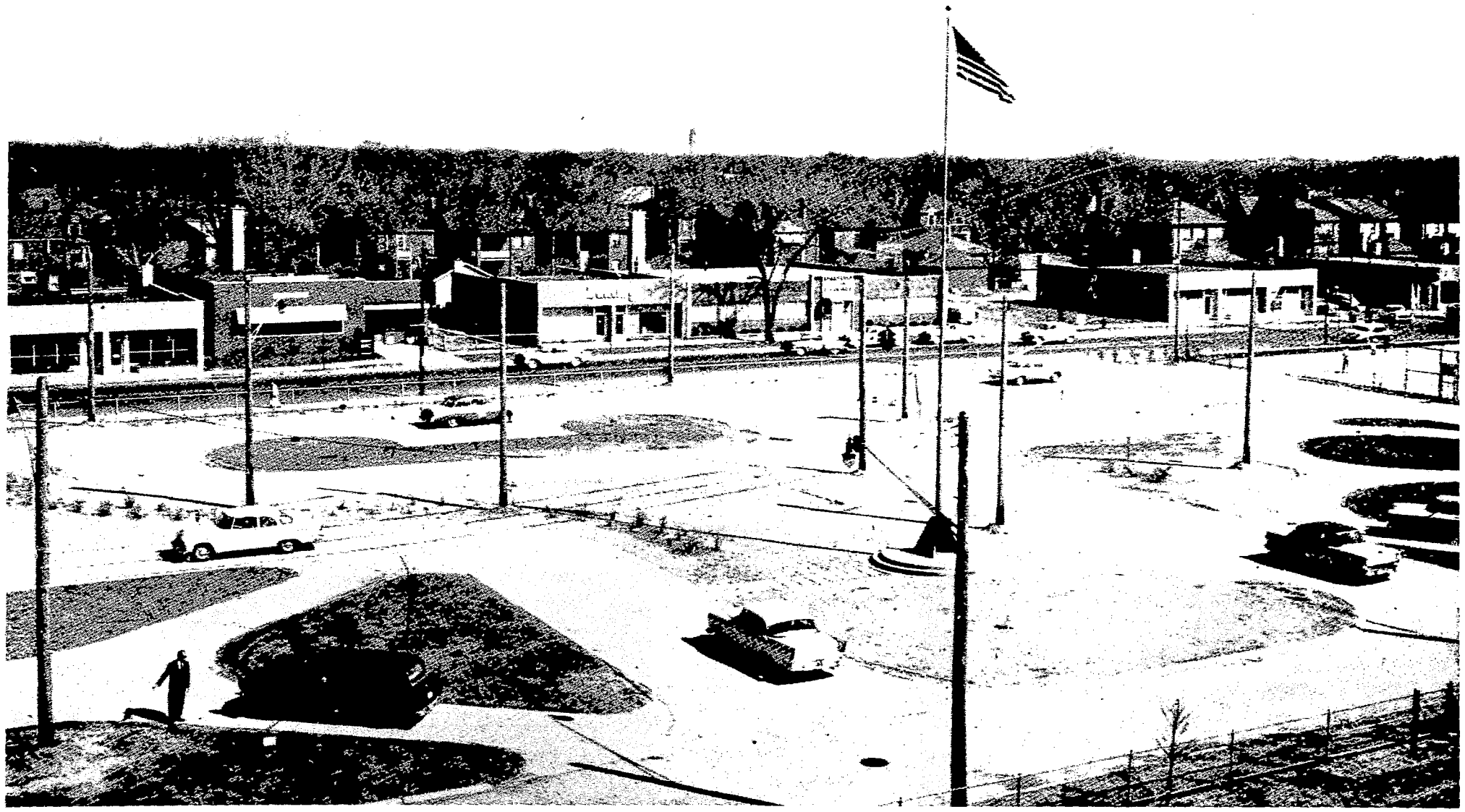
After initial off-street practice under skilled supervision, beginners are introduced gradually to driving on streets in traffic. As students gain more competence, the later stages of instruction and practice should provide as many different types of realistic driving situations and traffic conditions as possible.

Many school systems utilize off-street areas for the early instruction in practice driving. A few school systems, however, have provided off-street facilities on school grounds especially designed for efficient teaching and learning in the early stages of practice driving instruction. Examples of the latter include Chicago's Lane Technical High School, the N. R. Crozier Technical High School in Dallas, Tex., and several high schools in Detroit, Mich.



LANE TECHNICAL SCHOOL DRIVING LABORATORY, Chicago, Illinois

Name _____ Age _____
Date _____ Period _____ in Driving Course
Div. Room _____ Div. Teacher _____
I Have Driven Cars For _____ Years _____



PUBLIC SCHOOLS, DETROIT, MICH.
Driver training area.

The planned off-street practice driving area should be approximately 200 x 500 feet and provide a street layout with intersections, turns, a slight hill, stop signs and a traffic signal, diagonal and parallel parking spaces, a backing lane, and space for special steering exercises.

Outdoor Meetings

School grounds in many communities are used not only for physical education and recreation and outside study but also as meeting places for outside programs for both the school and community. Where there are sufficient acreage and appropriate natural features, certain performances involving groups of pupils or adults may be executed more efficiently on the grounds than inside the building. Such activities may be in dramatics featuring pageantry, music festivals and band concerts, and graduations.

DRAMATICS.—In elementary schools pupils often dramatize stories. Such activities may be on a stage in the auditorium or a little theater, but when the action of the play requires an outside scene, they use school grounds where facilities are adequate. This environment may make the action much more meaningful and realistic, so the teacher and pupils go outside and find an appropriate spot for practice and final performance. On some occasions they invite other groups to be an audience for the final rendition. A stage may be improvised in a natural setting, possibly near a wooded area, and chairs arranged for the audience.

In many schools spring pageants, in which there is pomp and display with pupils wearing gay costumes, become elaborate spectacles. These programs may require the construction of large platforms with improvised scenery; sometimes this may be the natural trees, shrubs, flowers, or even a lake or stream, or a hill on the grounds. Or the pageantry may be a Maypole drill which requires level ground and seats in the form of bleachers for spectators. Such festivals draw large crowds of parents and other patrons.

MUSIC.—Many schools, where outdoor space is adequate, use school grounds in the music program, especially for larger groups, such as glee clubs and bands. A culminating activity for music classes in both elementary and secondary schools in many communities is a spring festival on the school grounds. This performance may involve large groups of singers. These may be from one school or from several schools. In fact, music festivals have become statewide in some parts of the country, and hundreds of pupils meet, either in large auditoriums or in outdoor theaters, to sing together. Such festivals, when given out-of-doors, draw large audiences from all parts of the State

Bands are popular in both elementary and secondary schools. School grounds all over the country are scenes for rehearsals and for band concerts. Many bands practice marching on school grounds in preparation for special events, parades, and football games. Fortunate is the band teacher who has ample grounds for rehearsals. In many communities where grounds are inadequate, the band drills on adjoining streets or any available vacant lots. Such arrangements are unsatisfactory and are doleful reminders that those who selected the site did not look very far into the future to anticipate expansion of school activities.

GRADUATION.—In many schools graduation exercises are conducted on school grounds. Such occasions are important events in the life of a community and require seating facilities for large audiences of parents and other patrons, as well as student bodies. Platforms are often constructed on football fields for the exercises. Sometimes they are built on the main grounds, thus taking advantage of an attractive background of natural scenery, such as trees and shrubs.

Use of outdoor space for these events may save the school the expense of constructing large auditoriums to accommodate big crowds, since in many communities the trend is to build comparatively small auditoriums for school purposes.

Many schools and colleges provide an amphitheater for outdoor programs. It may be constructed in a natural bowl, or near a hillside, where permanent seats are constructed on the side of a hill, or on level ground where built-up bleachers may serve to supplement folding chairs placed in a semicircle in front of a platform for the audience. Amphitheaters encourage outdoor meetings for both the school and community. Where such facilities are adequate, schools may use them for outside programs such as class plays, band concerts, and community singing. Community public speaking events are often promoted in the school's amphitheater. Not all school grounds should have an amphitheater, but site committees would do well to examine the need for such a facility in the school and community.

Opinions on Site Purposes

The school site, according to the opinions of a representative group of school plant specialists, should provide space and equipment for physical education, athletics, outdoor study, play and recreation for children, outdoor assemblies, driver education, camping instruction, and meeting places for boys' and girls' clubs; parking for both school people and visitors, facilities for summer recreation for children and adults, approaches to buildings, and areas for exhibits, picnics, and projects in agriculture and gardening; for landscaping and school and community beautification.

IV. SELECTING AND ACQUIRING THE SCHOOL SITE

The task of selecting a school site is so important that an analysis should be made not only of needs today, but of the projected program of both the school and community at least a few years into the future. The board may be selecting a site which will be a school center for many years to come. Well-organized information should be available in tabular form, diagrams or maps, and straightforward written statements.

Selecting a school site involves finance, legal, personal, political, public relations, and communication problems. The key figure in evolving these problems is usually the school superintendent or the business manager.

Procedures

After needs have been determined, the district board, upon recommendation of the superintendent, should appoint a site-study committee with broad community representation. The personnel of the committee might well include faculty representation—a principal and certain teachers—well informed lay citizens, an architect or an engineer, a realtor, and other community planners.

Before actually examining prospective school sites, the committee should consider carefully the size of school sites needed for the modern program. It is not always possible to acquire sites that meet present-day standards. Although the convenient location of a school within its contributing area is desirable, it is best to sacrifice centrality in favor of other qualities, particularly superior size and environment. Size is given consideration before location. Modern means of transportation have much to do with this. The committee should study carefully modernization and expansion of the community's road systems. It will still be important to select a site as near the center of the school's population as is practicable. Certain maximum walking distances, particularly for elementary schools, should be considered in the selection of sites. However, the spatial requirements for secondary school sites will often preclude centrally located facilities.

Exploring the possibilities of cooperation with other community agencies is important. At the very least, information should be secured relative to their plans and programs. Park boards and recreational commissions in some communities cooperate with schools in planning facilities for joint usage. Sometimes such an arrangement offers the only solution to securing a desirable site. Children who attend schools located near parks may have access to unlimited space during the day and yet not in-

fringe on use of the park by the general public, since community use is largely confined to after-work hours and during summer vacations, when schools are not in session. The committee should examine carefully the board's master plan for school buildings. This is especially true with reference to attendance areas. Even if there is no master plan, there are zoning ordinances which control the nature of construction and use of buildings, which in turn affect the child population of their section of the community.

The relationship between any proposed site and existing or possible future school sites is of primary importance. Overlapping of attendance areas should be avoided. A first step in providing a solution to this problem is the establishment of a definite educational policy for the community. If the 8–4 school organization plan is to be used, one pattern of site selection will develop. Should the 6–3–3 plan or any other combination of grade groupings be used, another policy may be established in regard to site selection. Basic guiding policies developed by establishment of a grade-range organization will provide a sound basis for further considerations of desirable site location.

It is becoming more apparent that the school which is to function effectively needs to be readily accessible from all parts of its service area. The committee should, therefore, consider carefully the type and number of approaches to a school site, as well as centrality. Travel time seems to be taking precedence over walking distance.

Before setting up criteria and going out to evaluate proposed sites, the committee should consider adoption of certain basic planning guides, including the following:

Promotion and protection of the health and safety of pupils are obligations of the school board.

Environment influences the lives of children and young people.

A school program changes with its social order.

Cooperating with other community agencies is fundamental.

Abiding by policies of an authoritative board is sound procedure.

School building design is an important factor in determining school site adequacy.

Outdoor instructional space is less expensive than indoor.

Selecting sites in advance of needs, where feasible, is sound long-range planning.

The location of school plants influences their potentialities as community centers.

Criteria

It is not proposed here to offer a long list of standards which must be met in all situations, but rather to suggest some desirable characteristics of a good school site. These are discussed in the following five categories: (1) Healthful and safe, (2) functional, (3) economical, (4) attractive, and (5) adequate for the program.

HEALTHFUL AND SAFE.—More important than the location of school facilities are the inherent health and safety factors of any piece of land to be considered. A school should be located in a pleasing environment, in a desirable neighborhood, free from excessive noise, smoke, dust, and congested traffic. Good teaching situations within the school and on the grounds call for quiet surroundings, clean air, and abundant sunshine. Therefore,

areas where dust, noise, odors, smoke, and high buildings are present should be avoided if at all possible. Such are depressing and annoying, and there is little or no justification for selecting sites that subject persons to irritations from these sources. To avoid such hindrances to the school program, many communities are locating schools on the fringe of towns and cities where feasible.

An attractive school site, functionally planned for recreation and physical education, invites participation. Physical education teachers prefer outdoor areas to indoor when the weather is suitable. In fact, many of the sports and games most enticing to children and youth cannot be effectively carried on inside the building. Ample school grounds, therefore, promote good health by making it possible for pupils to participate in an invigorating physical education program.

Congested activity areas, particularly when different age groups are on the grounds at the same time, contribute greatly to the number of student injuries each year in the schools of the country. Playground areas, therefore, should be large enough to accommodate several activities to be carried on at the same time on the school grounds. Playgrounds should be located and oriented so that ample room is provided for a variety of game activities.

The approaches to the school grounds which are traveled by pupils should not be main traffic arteries, nor should the approaches cross main traffic arteries, railroad rights-of-way, or business and industrial traffic. If the site must border a highway, the entrance should be on a side street.

Where school grounds drain readily, surfaces tend to dry hurriedly, thus permitting outside activities soon after a rain. It is quite generally accepted that a subsoil of sand or gravel aids materially in drainage. Since spacious areas covered with grass or other vegetation are particularly desirable, the topsoil of the site should be suitable for turf. (Playground surfaces are discussed at length in section V.)

The school board should give careful consideration to the health and safety of children and youth as they examine prospective pieces of land for the location of schools, because the lives and welfare of young Americans are at stake.

FUNCTIONAL.—In appraising plots of land for proposed school sites, the committee should be conscious of the fact that school sites, in addition to the functions of providing a foundation for the buildings and for landscaping and beautification, furnish the play areas and facilities for the school's recreation and physical education program.

In the opinions of members of the National Council on Schoolhouse Construction, the school site accommodates a wide variety of purposes in today's programs. The following, listed in order of frequency reported, are their recommendations: Physical education, community recreation, parking space, outdoor study, community projects, including agriculture, gardens, exhibits, and picnics; community attractiveness, meeting places for boys' and girls' clubs, play areas for children during vacation, athletics, spaces for loading and unloading pupil buses, approaches to buildings; student assemblies, dramatics, music, graduation, driver training, and camping instruction.

Land which is usable without undue expenditures of filling and grading and has sufficient drainage can be readily converted into functional space. In determining adequate areas required, the committee should think of land which can be used in the school and community program. Woods, streams, and hills can contribute to good recreation situations and be used to advantage in outdoor instruction. However, ballfields and courts require comparatively level areas.

LAKEWOOD JUNIOR AND EVERGREEN SENIOR HIGH SCHOOL, SEATTLE, WASH.

This lake adds to the scenery and is used in the school and community program.

School grounds hemmed in by permanent structures cannot expand nor can they be conveniently rearranged to accommodate new school programs and community recreation.

Functional school grounds can be arranged so that certain areas are multipurpose. In determining space requirements the board should be assisted by physical education teachers and recreation directors, who can, among other contributions, designate certain play areas which may serve dual or triple purposes. No school is justified in specifying a large area for school grounds unless it can be used to advantage in the program, either now or in the future.

Community recreational programs are making demands on school grounds, as well as on parks and other public recreational areas. In addition to the community recreational program on school grounds, many schools carry on an extensive athletic program, which not only requires ball fields, gridirons, and courts, but parking space for spectators of these sports.

Schools which provide pupil transportation should furnish adequate and safe loading space and unloading space for pupil buses on the school grounds. Entrances for school buses to the buildings should preferably come from side streets, and they should never cross walks and paths of pupils who walk to the building. The location and orientation of the grounds help determine the designs of entrance drives and walks.

Where vocational agriculture is taught, the school board should secure information from vocational teachers relative to school site requirements for experimental projects on the campus. The agricultural shop will need a special entrance for farm machinery. High schools and elementary schools in many communities feature school gardens as a means of outdoor instruction and also for beautification of the school grounds and the community. Such projects imply the need for studious consideration of the location of the school site and for adequate areas for the promotion and development.

ECONOMICAL.—Since the primary purpose of a school site is to facilitate the educational program, it is good economy to select sites which have desirable educational characteristics. It is poor economy to build a school on a site which is inadequate and thus handicap the educational program for 50 years.

A school site should be utilized to the maximum insofar as possible. It is sound and economical planning to select and improve school sites which may accommodate not only the school's outside activities but also community activities. In many large cities, as pointed out above, the school board and the park and recreational commissions find it economical to plan and design so that certain facilities may be used jointly. In such instances school buildings are located near community parks, and sometimes in parks, so that park facilities are available for physical education and recreation when schools are in session, and for community recreation during weekends and summer vacations.

Some school systems in the country, through a plan of long-range study, are able to select and purchase land for proposed school sites far in advance of their actual need for building sites. By so doing the schools not only can select the desirable pieces of land for sites which will facilitate the school and community programs, but can buy at comparatively low prices, thus saving the school system a great amount of money. This procedure, however, is not possible in many school districts, because of their lack of funds to purchase future school sites. It is sometimes more urgent to provide classrooms and facilities for a

congested enrollment than to buy future sites. In such instances it might be possible to acquire options without making a large investment of capital outlay funds.

It is true that centrality of a school site is often sacrificed for a desirable piece of land located elsewhere, but the school board should not lose sight of the fact that transportation to and from school over a long period of years is an important item of expense to the patrons or to the school itself. Locating the school on a site which requires pupils to travel long distances is poor economy and should be avoided when possible and feasible.

A site which may seem excessively high for the original cost may prove in the long run to be economical when all factors are considered, since the initial cost is only one part of the ultimate expense. Some land which may be conveniently located and seem desirable from that standpoint may prove to be inadequate because of physical defects. It is economical to select land which has a slightly convex surface and is moderately elevated above surrounding ground. Such characteristics will insure natural drainage and save the school the added expense of grading and filling. It is advisable for the committee to determine the water table of a piece of land. Many schools have been constructed on land with high water tables, which cause seepage under foundations and in basements. This is often very expensive, if not impossible, to remedy. The committee should also make test borings of a proposed site to determine its suitability for the foundation to support the buildings. Some ground, such as places which have been filled in by debris or for other reasons is unstable, may require very deep and expensive footings to support the buildings. In many instances, especially in large cities, inadequate school sites must bear much of the blame for skyrocketing school construction costs. Money spent to overcome the obstacles of an unwieldy site is a dead loss.

Many school boards in the country have been frustrated when enrollments increase and they find the site is not large enough to permit an addition to the present structure. Schools in many communities are not only expanding by increased enrollments but also growing by an enrichment of the school program. For example, the increased emphasis on physical fitness today is demanding more land for adequate outside play areas and facilities. The school board should, therefore, bear in mind that it is economical to acquire in the original purchase some extra acres to provide for expansion and growth.

Land should be selected for a school site that will not require expensive landscaping. The committee may be able to select a site which has desirable trees, shrubs, and grass. If such is true and these natural features can be preserved, a large amount of the school's money will be saved. It seems foolish to bulldoze natural trees and shrubs and later replace them with expensive nursery trees and plants. There is a movement today in site development to preserve the desirable natural features of a school site.

The school board should investigate the possibility and availability of utility services for a proposed school site. The location of the site could make a big difference in the cost of connections with utility lines and services, such as water, sewer, gas, and electricity. A school, for example, could be placed so that it would not be possible to connect with a city sewage disposal plant, making it necessary to provide a separate, expensive disposal plant.

The State and local plans for reorganization of school districts should be investigated by the site selecting committee. It is poor economy to select and build on a site not in conformity with a long-time plan. Such procedure may cause a school to be illogically located because of overlapping attendance areas.

The following criteria on economy in choosing a school site summarize some of the essential points to remember in evaluating a proposed site:[1]

The site should be large enough not only to accommodate adequately the necessary building or buildings but also to provide ample space for outdoor instruction and recreation, for parking, and for future expansion of buildings and play area.

The site should be readily accessible not only to the children who will attend the school but also to the general public for community use educationally or recreationally.

The site should be so located that water, sewers, electricity, and other utilities can be provided at reasonable cost.

The site should have an elevation and contour which will insure good drainage and a type of subsoil which provides a good base for building footings and foundation.

The site should be selected with due regard to its proximity to public recreational, educational, and cultural facilities such as parks, libraries, and museums.

The site should be one which lends itself readily to landscaping and provides a pleasing and beautiful natural environment.

The site should be purchased before the need becomes critical.

ATTRACTIVE.—The influence of environment in the life of a child is appropriately expressed in the following lines:

There was a child went forth every day
And the first object he look'd upon, that object he became,
And that object became part of him for the day
Or a certain part of the day,
Or for many years or stretching cycles of years.[2]

Since school plants are part of the daily scenes of school children and young people, they should be located in an environment that stimulates love and appreciation of the beautiful in life. Beautiful functional buildings placed on adequate grounds in an attractive environment help to create in children an appreciation for schools and in adults an added civic interest and respect for the dignity of education.

Aside from purely physical considerations, it is unquestionably true that the wholesome cheerfulness and beauty of the school site will pervade the entire school and be reflected in countless ways in the attitude and work of the pupils. In the same manner the effects of a cramped and cheerless site will be far reaching. Since dust, noise, and physical hazard are attributes generally associated with congested areas, crowded neighborhoods as locations for schools should be rejected in favor of rural or open residential surroundings, where possible and feasible.

It is important that the school be surrounded by streets and residences that are attractively designed and landscaped, but the school grounds should be equally attractive, thus contributing to community pride and develop-

[1] Flesher, W. R., *and others. 13 Principles of Economy in School Plant Planning and Construction.* National Council on Schoolhouse Construction, W. D. McClurkin, Peabody College for Teachers, Nashville 4, Tenn. 1954. p. 6.

[2] Whitman, Walt. *Leaves of Grass.*

SOUTH JUNIOR HIGH SCHOOL, PITTSFIELD, MASS.

A school site in an attractive environment.

ment. There should be attractive views, if possible, from all angles of the plant. Some schools are fortunately located so that they have not only attractive neighborhood surroundings but beautiful forests, lakes, streams, hills, or mountains in the background. Of course, this is not possible in many communities, but it illustrates the importance of beautiful views.

A school site, to be attractive, should be large enough to accommodate functional buildings designed to fit the school grounds and in keeping with good architecture in surrounding structures. A congested site does not permit pupils, teachers, and the public to enjoy attractive surroundings in the immediate neighborhood or in the background.

Where the architect for a school building project has been selected, it would be well for him to advise with the school authorities relative to proposed sites. He will know better than anyone else the possibilities of a site from an architectural standpoint. For example, if the school people and the board desire a functional one-story, spread-out type of building, the architect would be able to advise on the characteristics desired in a site for such a structure. He can be of great assistance by indicating in preliminary sketches how buildings would be located on the proposed site in a master development plan, thus enabling school and lay citizens to see favorable or unfavorable features which they might not discover without his help.

It is not always possible to select a site with a desirable rectangular shape, having a ratio of the width to the length of about 2 : 3 or 3 : 5, but if the site has sufficient frontage, it is always possible for a good architect to design attractive buildings to fit the property and its surroundings.

It is important that a study be made of the future community development program where a proposed site is located before making a recommendation for purchase of a site. There may be possibilities for future development and construction of unsightly factories, congested business centers, undesirable taverns, railroads, and noisy and hazardous parkways which would detract from its potentialities as a school site. Such unforeseen developments are some of the reasons for locating schools in desirable residential areas where zoning ordinances would prohibit the extension of commercial and industrial construction projects. Cooperative planning, investigation of zoning ordinances, study of present and future population trends, and trends of commercial and industrial development are sound procedures which are used by farsighted school boards and administrators in the selection of school sites.

A well-selected site with the characteristics described in this section does not insure beautiful grounds. It must be developed in accordance with a master plan. This is discussed at length in section V, where suggestions are made on functional layouts, surfacing, planting, and maintenance.

ADEQUATE.—In determining the adequacy of a proposed site the school board must decide whether there is room or area sufficient for the program and the buildings, including future expansion. After interviewing the principal and teachers, other school employees, and recreational director, a list should be made of needs for space in operating the school and community program, such as suggested by members of the National Council on Schoolhouse Construction, on page 40. A method used successfully by many schools in determining space needs is to make trial layouts of each proposed site. This is done by cutting templates to scale to represent the buildings and the various outdoor areas and facilities. By such procedure it is not too difficult to determine the adequacy of a piece of land for a school site. The services of a good draftsman can be very helpful at this point.

To make such a study, the committee will need additional information on the educational policies, the type of school to be housed, planned or anticipated community use of the site, and ultimate enrollment of the school.

Information in table 3 concerning State minimums and formulas for increasing site acreage requirements as enrollments increase was obtained from State guides on school plant services and by questionnaires from State school plant supervisors. State school plant supervisors from the respective States reviewed information in the table for accuracy.

Table 3.—Recommended Minimum Size of School Sites and Formula for Additional Acres by States and Type of School

State	Elementary schools		Secondary schools	
	Minimum (acres)	Formula or comment for additional acreage	Minimum (acres)	Formula or comment for additional acreage
(1)	(2)	(3)	(4)	(5)
Alabama	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Arizona	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Arkansas*	10	For 360 pupils; 1 extra for each additional 100 pupils.	25	For 500; higher enrollments, 40 acres.
California*	5	Plus an additional acre for each 100 pupils.	30	Plus an additional acre for each 100 pupils.
Colorado*	5	Plus 1 acre for each 100 pupils maximum enrollment.	15	Plus 1 acre for each 100 maximum enrollment.
Connecticut	5	Plus an additional acre for each 100 pupils.	10	Too low; might well be 20 acres.
Delaware*	2	Plus an additional acre for each 100 pupils.	5	Plus an additional acre for each 100 pupils.
District of Columbia	5	.....	7	For junior high; 10–15 for senior high.
Florida*	2	Plus an additional acre for each 50 pupils.	2	Plus an additional acre for each 50 pupils.
Georgia	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Idaho*	5	Plus 1 usable acre for each additional 100 pupils.	10	Plus 1 usable acre for each 100 additional pupils.
Illinois*	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Indiana	7	Up to 200 pupils; plus 1 for each 100 pupils.	12	Up to 300 pupils, plus 1 acre for each 100 pupils.
Iowa	4	Average—4–5 acres; recommend 5 acres up.	20	Recommend 30–40 acres according to enrollment.
Kansas	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Kentucky	5	For small, 10 for large, plus 1 for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Louisiana	5	Plus 1 acre for each 100 pupils; 7 for each 200 pupils.	10	Plus 1 acre for each 100 pupils; 15 for each 500 pupils.
Maine	5	Plus 1 acre for each 100 pupils; 7 for each 200 pupils.	10	Plus 1 acre for each 100 pupils; 15 for each 500 pupils.
Maryland	8	Local board decision. 10 acres suggested.	20	For junior high; 30 for senior high.

*Information obtained from State school building handbooks, except in States followed by an asterisk (*) which indicates that information was obtained from responses to questionnaires.

Table 3.—Recommended Minimum Size of School Sites and Formula for Additional Acres by States and Type of School—Continued

State	Elementary schools		Secondary schools	
	Minimum (acres)	Formula or comment for additional acreage	Minimum (acres)	Formula or comment for additional acreage
(1)	(2)	(3)	(4)	(5)
Massachusetts	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Michigan	.....	No rule-of-thumb formula. Guide to approximate space needs is provided by State department. Larger areas required where community colleges are included in programs.		
Minnesota	8–10	For K–6; 10–12 acres for K–12.	20–25	For junior high; 30–40 for senior high or combination.
Mississippi	5	Plus an additional acre for each 100 pupils.	15	Plus an additional acre for each 100 pupils.
Missouri	5	Should range from 5–10 or more acres.	10	Should range from 10–30 or more acres.
Montana*	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Nebraska*	10–15	Procure new sites for over 300 pupils or two K–6 units.	30–40	New sites for junior-senior, or for either over 700 pupils.
Nevada*	5	Usable acres plus 1 for each 100 pupils.	20	Usable acres for junior high, 30 for senior high; plus 1 acre for each 100 pupils.
New Hampshire	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
New Jersey	5	Plus an additional acre for each 100 pupils.	20	Plus an additional acre for each 100 pupils.
New Mexico	15	No formula established.	30	No formula established.
New York	5	Plus an additional acre for each 100 pupils.	10	Plus 2 acres for each 100 pupils up to 500; plus 1 acre for each 100 pupils over 500.
North Carolina	10	For 200–400; 12 for 500–600; 15 acres for 800.	12	For 299–400 pupils; 14 for 500; 16 for 600; 20 for 800; 24 for 1,000; 26 acres for 1,200.
North Dakota	5	For 200 pupils, 7 acres; 8 for 300; 9 for 400; 15 for 1,000 pupils.	10	Plus an additional acre for each 100 pupils.
Ohio	5	Plus 1 acre for each 100 ultimate enrollment.	10	Plus 1 acre for each 100 ultimate enrollment.
Oklahoma*	5	Plus 1 acre for each 100 pupils ultimate enrollment.	10	Plus an additional acre for each 100 pupils.
Oregon	5	Plus 1 acre for each 100 pupils (6 acres for 100).	10	Plus an additional acre for each 100 pupils.

Table 3.—Recommended Minimum Size of School Sites and Formula for Additional Acres by States and Type of School—Continued

State	Elementary schools		Secondary schools	
	Minimum (acres)	Formula or comment for additional acreage	Minimum (acres)	Formula or comment for additional acreage
(1)	(2)	(3)	(4)	(5)
Pennsylvania	8–12	Urban; rural, 10–14; suburban, 18–20.	20–25	Junior high urban; rural, 20; suburban 25–30.
			35–40	Senior high urban; suburban and rural, 40–45.
Rhode Island*	5	Plus an additional acre for each 75 pupils.	25	Plus an additional acre for each 75 pupils.
South Carolina*	10	For 500 pupils maximum, plus 1 acre for each 100.	10	Plus an acre for each 100 pupils.
South Dakota*	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Tennessee	4	For grades 1–8, plus 1 acre for each 100 pupils.	8	For grades 7–12 or 12 grades, plus an additional acre for each 100 pupils.
Texas	5	Plus an additional acre for each 100 pupils.	15	Plus an additional acre for each 100 pupils.
Utah*	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Vermont	5	For 100 pupils; 7½ for 200; 10 for 300; 11 for 500; 12–13 for 700; 17 for 1,200.	10	Plus an additional acre for each 100 pupils.
Virginia	3	For grades 1–3; grades 1–7, 4; plus 1 for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Washington*	5	Plus an additional acre for each 100 maximum enrollment.	10	Plus 1 acre for each 100 maximum enrollment
West Virginia	5	Plus an additional acre for each 100 pupils.	10	Plus an additional acre for each 100 pupils.
Wisconsin*	5	Plus an additional acre for each 100 pupils.	15	Plus an additional acre for each 100 pupils.
Wyoming*	.....	No minimums established.	.....	No minimums established.
Alaska*	5	Recommend an additional acre for each 100 pupils over original capacity.	10	Recommend an additional acre for each 100 pupils over original capacity.
Puerto Rico*	1½–2	For 8–24 classroom buildings.	4½–5	For 8–24 classroom buildings.

Data in table 3 show 34 States with minimum site recommendations for elementary schools of 5 acres, 6 States with minimums less than 5 acres, 9 more than 5, and 1 no minimums, with all States except 3 using the formula for increasing acreage by adding an acre for each 100 pupils. One of these exceptions adds an acre for each 75 pupils, another an acre for each 50 pupils, and the third uses a special formula of 5 acres for 100 pupils; 7½ acres for 200; 10 acres for 300; 11 acres for 500; 12 acres for 700; 17 acres for 1,200 enrollment.

In secondary schools 27 States report minimum sites of 10 acres; 17 States, more than 10-acre minimums, 5 States with minimums less than 10, and 1 State with no minimums. As in elementary schools, most States recommend adding an acre to the minimum for each 100 pupils.

Some interesting exceptions to the commonly used formula are: Arkansas' recommendation of 25 acres for 500 pupils and 40 acres for higher enrollments; Indiana's 12 acres up to 300 plus an acre for each 100 pupils; Kentucky's 10–15 acres for junior high and 25–30 acres for senior high school; Nebraska's minimum of 30–40 acres and suggestion for new site when junior-senior high exceeds 600 enrollment and when a junior or a senior high exceeds 600–700; Nevada's 20 usable acres for junior high and 30 usable acres for senior high plus an acre for each 100 pupils; and North Carolina's 12 acres for 200–400 enrollment, 14 acres for 500, 16 acres for 600, 20 acres for 800, 24 acres for 1,000, and 26 acres for 1,200.

The National Council on Schoolhouse Construction, in a revised 1958 edition of the *Guide for Planning School Plants*, suggests the following minimums by type of school:

School	*Acres*
Elementary	5
Junior high	20
Senior high	30

The formula for increasing the size of sites as enrollments increase—plus an additional acre for each 100 pupils of predicted ultimate enrollment—applies in each of three types of schools. According to these proposed standards, an elementary school of 500 pupils would require a minimum of 10 acres; a junior high with 500 pupils, 25 acres; and a senior high with 1,000 pupils, 40 acres.[3]

Because the site size problem varies in accordance with the needs of the type of school organization and in terms of the age and development status of the community or school district, the foregoing suggestions must be taken as minimums for which all should strive and which most should exceed. It should be recognized, however, that each type of situation has its own specific variations which must be studied before sites are chosen.

The Council's recommended minimum sizes for junior and senior high school sites are substantially increased over the secondary school site minimums recommended in the 1953 *Guide*. A minority report of the Council's school site committee, however, also favored increasing the base acreage for elementary school sites from 5 to 10 acres. The necessity for larger sites, according to the new *Guide*, is due to a number of trends, such as (1) space for outdoor teaching areas; (2) single-story structures; (3) single-loaded corridors; (4) campus and cluster type layouts; (5) the little-school or the school-within-a-school concept of school organization; (6) consolidation of attendance areas, resulting in larger schools, more buses, and regulations and practices requiring on-site bus loading and unloading; and (7) parking space for the ever-increasing number of teachers' and pupils' cars.

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[3] National Council on Schoolhouse Construction. *Guide for Planning School Plants*. The Council, George Peabody College for Teachers, Nashville, Tenn. 1958. p. 23.

In cities where high property values make the problem of purchasing an adequate site impossible, it will be necessary to plan so as to secure maximum utilization of the school plant with the least sacrifice. The following suggestions are offered by the Council for study to alleviate, insofar as possible, the limitations of inadequate sites in congested urban areas: Elevating the structure so that play area is available beneath it, including elevators in a multistory building, locating play areas on the roof, and building parking and storage areas underground. Suggestions with respect to playfields include the following: Plan for multiple use of the same area at different times of the day or during different seasons; stagger recreational periods so that only a portion of the student body would be on playfields at the same time; build the school adjacent to a public park or playground which could be used for school purposes, and provide fields for athletic practice and games in an outlying area where land is less expensive.

Recent reports from the States of Wisconsin and Connecticut on sizes of school sites of secondary school plants, as shown in tables 4 and 5, and from reports from members of the National Council on Schoolhouse Construction, indicate a definite trend to increase school acreage sites. The average size of sites in secondary schools for new secondary schools is about 30 acres. The range in one State was 5 to 120, and in the other 17 to 52. Out of 52 postwar high schools in Wisconsin only 8 report sites of less than 8 acres, and all of these have small enrollments except one city school of 1,500 pupils.

The acreage required for a particular school will depend upon the ultimate size and type of school center to be served, other community facilities available, climate, soil, and other natural features.

Checklist

The following criteria as suggested by members of the National Council on Schoolhouse Construction may serve as a valuable checklist:

- Size and shape adequate for present and future enrollment.
- As near as possible to center of pupil population, avoiding long travel distances.
- Location to avoid traffic hazards, disturbing noises, smoke, dust, and odors.
- Accessibility.
- Availability of utility services.
- Suitability of soil for building foundation and for vegetation.
- Cost is reasonable—land optioned well in advance, if possible.
- Contour fairly level, sloping away from buildings to assure good drainage.
- Consideration of present and future school and community programs.
- Environment.
- Topography.
- Esthetic appeal.
- Zoning and city planning regulations.
- Preservation of vegetation, including trees.
- Proximity to other educational and recreational institutions.
- Proximity to safety facilities.
- Suitable for construction.
- Ample space on site for parking and off-street loading and unloading of pupil buses.
- Availability for use in the educational program.
- Industrial and commercial expansion.
- Orientation in relation to climate.

Table 4.—Size of Sites of New Postwar High Schools in the State of Wisconsin [1]

Name of School	Grades	Community	Teacher Station [2]	Enrollment	Acres in site
1	2	3	4	4	6
Alma	9–12	Rural and village	7	175	35
Barron	9–12	Village	20	500	20
Beaver Dam	10–12	City	32	800	35
Beloit	10–12	City	60	1,500	7
Brookfield	9–12	City	30	750	25
Cedarburg	9–12	City	32	800	35
Clintonville	10–12	City	25	625	22
Colby	9–12	Rural and village	18	450	100
Delavan-Darien	9–12	Rural and city	28	700	50
Eau Claire	10–12	City	66	1,650	20
Eleva-Strum	9–12	Rural and village	10	250	40
Fennimore	9–12	Rural and village	14	350	35
Fish Creek	9–12	Rural and village	10	250	10
Fox Lake	1–12	Rural and village	14	350	5
Galesville-Ettrick	9–12	Rural and village	15	375	40
Germantown	9–12	Rural and village	20	500	35
Granville (Milwaukee County)	9–12	City	32	800	80
Gratiot	9–12	Rural and village	10	250	5
Green Bay West Junior High	7–9	City	52	1,200	15
Green Lake	9–12	Rural and village	9	200	5
Hartland	9–12	Rural and village	20	500	30
Hollandale	9–12	Rural and village	10	250	20
Hortonville	9–12	Rural and village	15	375	10
Janesville	10–12	City	60	1,500	120
Kenosha Central	9–12	Rural	15	375	40
Kewaskum	9–12	Rural and village	20	500	25
Menomonee Falls Junior-Senior	7–12	City and rural	12	300	8
Milwaukee North-West (Custer)	10–12	City	60	1,500	15
Minocqua-Woodruff	9–12	Village and rural	20	500	40
Monona Grove (Dane County)	9–12	Village and rural	20	500	20
Muskego	9–12	Village and rural	32	800	50

[1] State Department of Public Instruction, Madison, Wis., 1957.

[2] Any place in a school plant originally designed or adapted to accommodate some form of group instruction on a day-by-day basis and which is available and used for such purposes.

Table 4.—Size of Sites of New Postwar High Schools in the State of Wisconsin—Continued

Name of School	Grades	Community	Teacher Station	Enrollment	Acres in site
Neillsville	9–12	Village and rural	16	400	40
New Glarus	10–12	Village and rural	10	250	10
New Holstein	9–12	Village and rural	16	400	25
Nicollet (Milwaukee County)	9–12	City	60	1,500	40
Northwest-Maple (Douglas County)	9–12	Rural	14	350	40
Oshkosh Junior High	7–9	City	20	500	5
Pardeeville	9–12	Village and rural	12	300	5
Preble	9–12	Village and rural	20	500	25
Reedsburg	9–12	City and rural	24	600	20
Rhinelander	9–12	City and rural	32	800	40
Rice Lake	9–12	City and rural	30	750	35
Rosholt	9–12	Village and rural	8	200	8
Rothschild-Schofield	9–12	Village and rural	25	625	30
Seymour	9–12	Village and rural	24	600	33
Shawano	9–12	City and rural	25	625	10
Waterloo	9–12	Village and rural	16	400	35
Waukesha	11–12	City and rural	45	1,000	25
Wauwatosa Longfellow Junior High	7–9	City	50	1,250	10
Weston (Lime Ridge and Cazenovia)	9–12	Village and rural	10	250	89
Winneconne	K–12	Village	32	800	15
Wisconsin Dells	9–12	City and rural	20	500	25

Table 5.—Size of Secondary School Sites in the State of Connecticut [1]

Town or district	School	Capacity	Area (Acres)
1	2	3	4
Berlin	Berlin High School	725	17
Cheshire	Cheshire High School	642	50
Clinton	Clinton High School	370	23
East Hartford	East Hartford High School	1,459	26
Glastonbury	Glastonbury High School	933	35
Groton	Groton Senior High School	650	65
Newtown	Newtown High School	528	35
New Milford	Pickett School District [2]	611	17
North Haven	North Haven High School	1,267	52
Norwalk	Nathan Hale Junior High School	550	17
Plymouth	Terryville High School	461	15
Putnam	Putnam High School	455	50
Regional District No. 4	High School	715	49
Regional District No. 5	High School	975	54
Regional District No. 6	High School	435	33
Rocky Hill	Rocky Hill Junior High School	534	23
Shelton	Shelton High School	618	26
Southington	Southington High School	550	16
Stratford	David Wooster Junior High School	1,050	23
Stratford	Johnson Junior High School	575	14
Watertown	Gordon C. Swift Junior High School	550	17
Westport	Long Lots Junior High School	350	18
West Hartford	King Philip School [2]	1,500	44
Wethersfield	Senior High School	879	25
Windsor	Windsor High School	1,325	30

[1] State Department of Education, Bureau of Field Services, School Building Services, Hartford, Conn. 1954.

[2] Combination elementary-junior high schools.

Acquisition

Following the selection of a school site, the school board has the problem of actually acquiring the property. Three legal methods are usually used in acquiring land for school sites: Purchasing from the owner, accepting as a gift from a local citizen or firm, and taking private property by eminent domain.

Outright purchase by negotiating with the owner is usually the most satisfactory method. In most States school boards have authority to buy land for school sites. In other States a school site purchase must be approved by the electorate. Where different requirements are set forth in State laws it is usually the larger cities or more populous districts in which the board has authority and power to perform this function.[4] Approval of site purchase by some State agency is required in about one-fourth of the States.

Another method of securing property for school sites is by donation. There are certain precautions which should be used in considering gift sites. A free site may not be suitable, or it might require undue expense to develop for functional use. However, free site proposals certainly should be considered. In some instances donors of land for school sites are sincere in wanting to help the schools, and incidentally they may have property which meets all the requirements. But school boards should not accept gift sites with reversion clauses, and should not build on a site without a clear unconditional title.

[4] Hayes, Dale K. *Legal Requirements Established by States Concerning the Public School Sites.* A doctoral dissertation. Teachers College, Columbia University, New York. 1955.

The third method for acquiring land for school sites is right of eminent domain, which is common in all States with varying conditions. This method gives public schools the right to acquire land for school sites by condemnation through the courts where owners refuse to sell or the price cannot be agreed upon. Such a procedure is necessary in some instances, though many school boards hesitate to use it. But since so large a segment of people of the community are influenced by the location of a school, and since the school may be on a particular site for more than a generation, school boards are justified in condemnation proceedings if necessary in acquiring an adequate school site. School administrators and boards should, of course, use every reasonable effort to acquire such property without court proceedings. Land obtained by this method is appraised, and the owner is paid at fair value prices.

Getting information about owners, title, tax records, and plot locations is usually the responsibility of the superintendent or business manager of the school board. There are several important details to follow in acquiring land for school sites dictated to some extent by State laws other than title, such as securing proposals for sale, securing appraisals, counter offers, and options.

There is relatively little State control over the disposal of school sites. In States where funds are provided by the State for the provision of school facilities there is usually some limitation placed upon the district's authority to dispose of sites. Some States have reversionary clauses which provide that land to be disposed of be returned to the original owner, or his assigns. This clause usually refers to property taken by condemnation proceedings or to land acquired by bequest.

V. PLANNING AND DEVELOPING THE SCHOOL SITE

Site improvement and development should be planned systematically by those who will use the grounds and facilities. Teachers, recreation directors, young people, and older citizens should be included on the planning committee. A community-wide site committee should be assisted by a school-planning specialist or a landscape gardener. Such assistance is available from the State education agencies of most States.

In planning a school site, there should be agreement on a master-plan layout to guide the development throughout the program. Some of the major considerations in site development are traffic, surfacing, location of buildings, activity areas, and beautification.

Traffic

Architects should correlate planning of the site to the building layout. Careful planning and designing to avoid hazards will remove many conditions contributory to accidents. For example, since bicycle riding to school is rapidly increasing, it is important that the site committee and architect give careful thought and consideration to the location of bicycle racks on the grounds. In some schools bicycle racks are not located adjacent to parking lots for automobiles, but in an area convenient to the buildings, away from car traffic. Bicycles should never be parked on play areas.

When hazards are due to bad site development, someone has neglected an important duty. Service and other drives all too often bisect school property, separating the school building from playgrounds. Drives should connect all necessary points in the simplest and direct manner consistent with good alignment, grades, and harmonious relationship. A single-entrance, two-lane drive with facilities for turning vehicles around at the point of passenger discharge and connecting with or ending in a parking area is usually the best solution. The U-shaped drive to the front of the building should be avoided. Such drives are traffic hazards, and otherwise detract from the attractiveness of the plant.

Walk layouts should follow the lines of least resistance. They should be far enough from the building to allow users to obtain a proper view of the building and allow ample space for foundation planting without crowding. At all changes in direction, the angles should be sufficiently filled out to prevent cutting or stepping on the grass. Walks connecting buildings should be short and as direct as possible. Walks should be wide enough to

meet the needs of the pedestrians using them. People do not readily single-file, but walk in pairs or groups. In most schools the minimum width of walks is five or six feet.

Play areas in 12-grade schools using a combined plant should be planned to separate groups of children into probably four units: Kindergarten-primary, upper elementary grades, junior high, and senior high pupils. In large schools, areas where separate instructors of the given area are provided for each sex, some of these areas should be further divided. Screening, such as natural barriers or planting, is desirable to separate them. Where playgrounds border streets, adequate protection from traffic and noise may require fences as well as planting.

Sites of adequate area will always prove safer than overcrowded and congested playgrounds. The planning of sites and buildings should make easy supervision of play areas, and provide convenient access for both pupils and instructors.

Surfacing

Over the years there have been significant developments in playground surfacing. Some valuable information is available, but more research is needed, especially on materials used in hardsurfacing certain areas. Table 6, which lists common varieties of surfacing materials and their desirable qualities, will assist planners at the local level to determine surfaces best suited for their purposes.

There has been a gradual change from earth, sand, and turf on the smaller play-court areas of school grounds to hard-surfacing, such as blacktop, which is being used throughout the country in an ever-increasing yardage. Such surfacing has made great gains because it permits greater flexibility and continuity of educational and recreational programs and allows more permanent improvements.

Table 6.—An Analysis of Playground Surfacing

SURFACES	QUALITIES									
	Year-round utility use	Multiple use	Dustless	Fine-grained, nonabsorbent	Durable	Resilient	All-weather footing	Reasonable cost	Low maintenance	Pleasing appearance
1	2	3	4	5	6	7	8	9	10	11
Earth	....	x	....	x	x	x	....	x	....	x
Turf	....	x	x	x	....	x	....	x	....	x
Aggregate	x	....	....	....	x	....	x	x	x	....
Bitumen	x	x	x	x	x	x	x	x	x	x
Concrete	x	....	....	....	x	....	x	x	x	....
Masonry	x	x	....	....	x	....	x	x	x	....
Miscellaneous [1]	x	x	....	....	....	x	....	x	x	....

[1] Tanbark, sawdust, cottonmeal, rubber, plastics and vinyls, asbestos, cement, boards, wood.

A recent study by the School Housing Section of the Office of Education of 54 school systems in 43 States, the District of Columbia, and Alaska provided the pertinent information on playground surfacing in table 7. The study was made with the idea of comparing materials used in different areas with varying weather conditions. However, it does not reveal significant differences, except in two California cities where hard-surfacing is not used under apparatus—one using a sand composition and the other tanbark.

Table 7.—Surfacing Playground Areas[1]

State and City	Areas—hard-surfaced	Materials Used			
		On courts	On ball fields	Under apparatus	For stabilizing soil
1	2	3	4	5	6
ALABAMA: Birmingham	Courts.	Concrete.	Chert mixed with No. 28 slag.	Dirt and sawdust.	Soil mixed with small slag.
ARIZONA: Phoenix	Courts and parking.	Concrete, blacktop.	Grass.	Blacktop, if anything.	Asphalt.
ARKANSAS: Hot Springs	Courts.	Asphalt.	Grass.	Rubberized asphalt.	
CALIFORNIA:					
Los Angeles	Courts, parking, some play areas.	Blacktop.	Turf.	Sand-composition.	Asphaltic sealer and sand.
San Francisco	Courts.	Sheet asphalt.	Turf.	Tanbark.	Ground cover—wild rye, ivy.
COLORADO: Colorado Springs	Near building.	Asphalt.	Sand, screened gravel.	Screened gravel.	Loam mixed with sand.
CONNECTICUT:					
Bridgeport	Playground—maximum possible.	Asphaltic concrete.	Grass, clay.	Sand or dirt.	Clay.
Hartford	Physical education, play and parking.	Bituminous concrete.	Turf.	No apparatus.	
DELAWARE: Wilmington	Parking and portion of play areas.	Laycold; amiesite aggregate.	Grass, earth.	Earth.	
DISTRICT OF COLUMBIA	Court and small play areas.	Asphalt concrete.	Turf.	Asphalt concrete.	Turf.
FLORIDA:					
Miami	Play court and parking.	Asphalt.	Grass.	Tumbling mats.	1" hot asphalt, concrete.
Tampa	Basketball court and parking.	Concrete and asphalt.	Clay.	Clay.	Clay.
GEORGIA: Atlanta	Parking and approach.	Concrete, blacktop, clay.		Clay.	

[1] Information in this table was obtained from city school systems.

Table 7.—Surfacing Playground Areas—Continued

State and City	Areas—hard-surfaced	Materials Used			
		On courts	On ball fields	Under apparatus	For stabilizing soil
1	2	3	4	5	6
IDAHO: Idaho Falls	Bicycle parking, service entrance.	Asphalt blacktop.	Turf.	Asphalt.	Asphalt.
ILLINOIS: Chicago	Outdoor gym, volley and basketball.	Bituminous.	Stabilized soil.	Tanbark and sand, 5:2.	Asphalt emulsion.
INDIANA:					
Indianapolis	Outdoor gymnasium.	Hot asphaltic concrete.	Sod.	No apparatus.	
Terre Haute	Physical education, wet-weather area.	Asphalt or concrete.	Soil and sod.	Asphalt and sand.	
IOWA:					
Des Moines	Limited—close to buildings.	Asphalt.	Grass.	Asphalt.	Pea gravel.
Sioux City	Part of general play area.	Blacktop.	Nothing special.	Dirt.	Gravel.
KANSAS: Wichita	Tennis courts.	Concrete.	Soil or sod.	Soil.	
KENTUCKY: Louisville	Total small sites 50% standard size.	Asphalt with sealer.	Grass.	Asphalt with sealer.	
LOUISIANA: New Orleans	Outdoor gyms.	Asphalt.	Grass.	Grass, soil, sawdust.	Oyster or clam shells.
MAINE: Bangor	Coldpatch or rolled hot top.	Coldpatch, rolled hot top.	Grass.		
MARYLAND: Baltimore	Small areas for bad-weather play.	Asphalt.	Turf.		
MASSACHUSETTS: Boston	Play.	Rice-mix asphalt.	Grass.	Rice-mix asphalt.	Asphalt.
MICHIGAN:					
Detroit	Tennis courts.	Concrete, tennis.	Grass.	Sand.	Calcium chloride.
Lansing	Basketball area.	Blacktop.			

Table 7.—Surfacing Playground Areas—Continued

State and City	Areas—hard-surfaced	Materials Used			
		On courts	On ball fields	Under apparatus	For stabilizing soil
1	2	3	4	5	6
MINNESOTA: Minneapolis	Elementary—all except ball; secondary—parking.	Bituminous paving.	Stabilized earth.	Bituminous paving.	Mixture of various earths.
MISSISSIPPI: Jackson	Paved courts.	Bituminous asphalt.	Grass.	Dirt.	
MISSOURI:					
Kansas City	Elementary—most play; secondary—courts.	Asphalt concrete.	Asphalt.	Blacktop (asphalt).	Asphalt.
St. Louis	Elementary—all but baseball.	Asphalt.	River gravel, plain dirt.	Asphalt.	Fly ash and lime.
MONTANA: Butte	Courts and near building.	Blacktop-asphalt.	Sawdust-gravel mixture; turf.	Blacktop.	Asphalt.
NEBRASKA: Lincoln	Courts.	High schools—cement.	Grass and sand.	Sand.	
NEW MEXICO: Albuquerque	Courts.	Asphalt.	Adobe-sand mixture.	Small gravel, sand and adobe.	
NEW YORK:					
Albany	Courts.	Stone, asphalt and sealer.	Grass and turf.	Grass and loam.	
Rochester			Turf.	Sod or tanbark.	Running tracks—cinders and loam.
NORTH DAKOTA: Fargo	Courts; under play apparatus.	Blacktop.	Soil or sod.	Blacktop.	Asphalt.
OHIO: Columbus	Courts.	Blacktop and asphalt.	Soil.	Nothing special.	No definite program.
OKLAHOMA: Oklahoma City	Courts.	Asphaltic concrete.	Grass.	Earth.	Asphalt.
OREGON: Portland	Near building; under apparatus.	Blacktop-asphalt.	Turf.	Blacktop.	

Table 7.—Surfacing Playground Areas—Continued

State and City	Areas—hard-surfaced	Materials Used			
		On courts	On ball fields	Under apparatus	For stabilizing soil
1	2	3	4	5	6
PENNSYLVANIA:					
Allentown	Physical education and playground.	Asphalt.	Turf, clay; sand infields.	Asphalt.	Asphalt topping ID–2.
Philadelphia	Part of play.	Bituminous concrete.	Grass.	Bituminous concrete.	
RHODE ISLAND: Providence	Milling and games.	Resilient bituminous asphalt.	Turf.	Sand.	Clay.
SOUTH CAROLINA: Columbia	Basket- and volley-ball courts.	Colpronia.	Bermuda grass.	Sand-clay.	
TENNESSEE: Memphis	Play and parking.	Asphalt.	Dirt.	Dirt.	Asphalt.
TEXAS:					
Amarillo	Courts.	Blacktop or asphalt.	Grass.	Earth.	Cement or resin.
Houston	Play and courts.	Blacktop stabilized.	Sodded sandy loam.	No apparatus.	Light stabilized shell.
UTAH: Salt Lake City	Half total play area.	Asphalt.	Turf.	Sand and asphalt.	Asphalt-cement.
VERMONT: Burlington	Parking.	Asphalt.	Sod.	Calcium chloride.	Calcium chloride.
VIRGINIA: Richmond	Drives, courts, parking.	Sand-asphalt.	Grass sod.	Sand-asphalt.	Asphalt binder and gravel.
WASHINGTON: Seattle	All-weather play areas.	Blacktop—concrete.	Sand-clay-sawdust mixture.	None.	
WEST VIRGINIA: Huntington	Around building.	Rubber, asphalt or slag.	Grass.	Rubber, asphalt, or slag.	Gravel with limestone.
WISCONSIN: Milwaukee	All except few grass diamonds.	Asphalt.	Most—asphalt, rest—grass.	Asphalt.	Not used.
WYOMING: Cheyenne	Courts.	Blacktop.		Pea gravel or concrete.	
ALASKA: Anchorage	Traffic areas, near building.	Blacktop.	Gravel.	Fine gravel blacktop.	

The parts of playgrounds hard-surfaced, in order of frequency, are:

Outdoor courts	26
Part of general play area	17
Parking space	10
Areas near building	7
Outdoor gyms	3
Service drives	3
Under apparatus	2
Bicycle parking areas	1

Materials used for hard-surfacing those areas include asphalt, sometimes called blacktop, and various mixtures such as asphaltic concrete, bituminous concrete, rolled hot-top, sand asphalt, coldpatch, and rice-mixed asphalt; concrete aggregate, crushed stone, rubber, and slag. Asphalt, or blacktop, is mentioned more often than any other surface.

Surfaces mentioned most frequently for ball fields are grass, turf, and sod. Others were combinations of earth and grass, chert and slag, sand, gravel, clay, stabilizing soil, asphalt, sawdust, adobe, and loam.

The following materials, listed in order of frequence reported, are used for stabilizing the soil on playgrounds: Asphalt, gravel, clay, concrete, calcium chloride, lime, ground cover, loam, slag, sand, fly ash, cinders, and resin.

Surfaces under apparatus seem to be more controversial than other areas because of accident hazards due to frequent falls by children who use such equipment. Some schools will not use any hard-surfaced areas under apparatus; others prefer it, claiming they have fewer accidents when a resilient, hard surface is used than with a more fluid material. Reports indicate the following variety in order of frequency listed: Dirt, sand, asphalt, blacktop, screened gravel, clay, sawdust, tanbark, grass, slag, rubber, calcium chloride, adobe, and loam. Four school systems reporting do not use fixed playground apparatus.

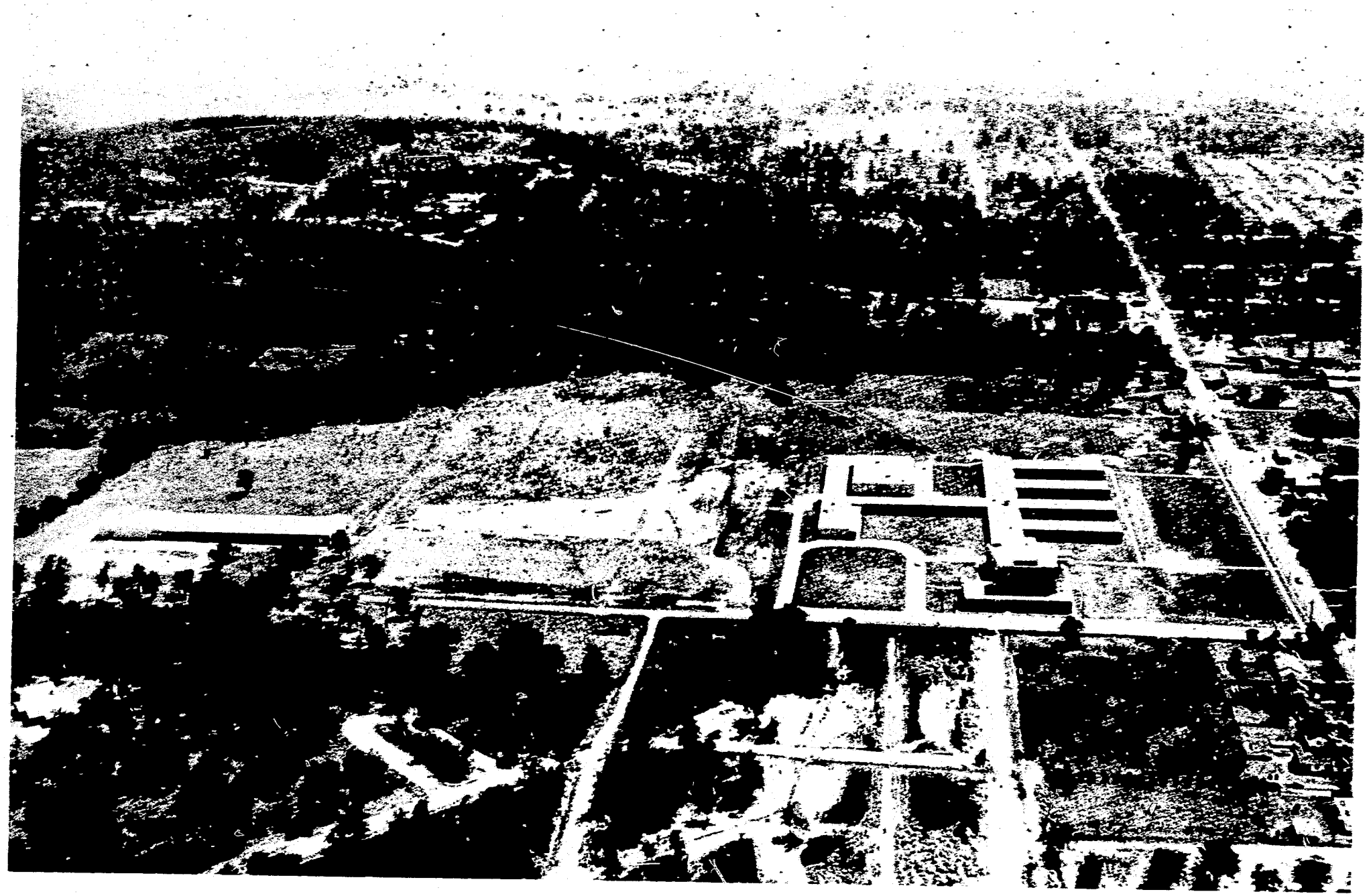
Turf is the most desirable surface on playgrounds, but constant use makes it difficult to maintain. Playground traffic has increased tremendously so that turf on many grounds soon becomes void of grass, and in a short time may result in dust, or mudholes causing uneven surfaces, which are accident and health hazards. Most schools try to build turf for ball diamonds, football fields, and other large surface areas, because it is the best surface for that type of games.

Earth or dirt can usually be used for certain field activities where turf cannot be grown. The existing soil may need to be treated or stabilized with some form of a binder to make a firm surface which prevents mud and dust. It is a process highly recommended, since it will help to remove accident and health hazards in many local situations. Most schools will need technical advice on this problem.

Location of Buildings

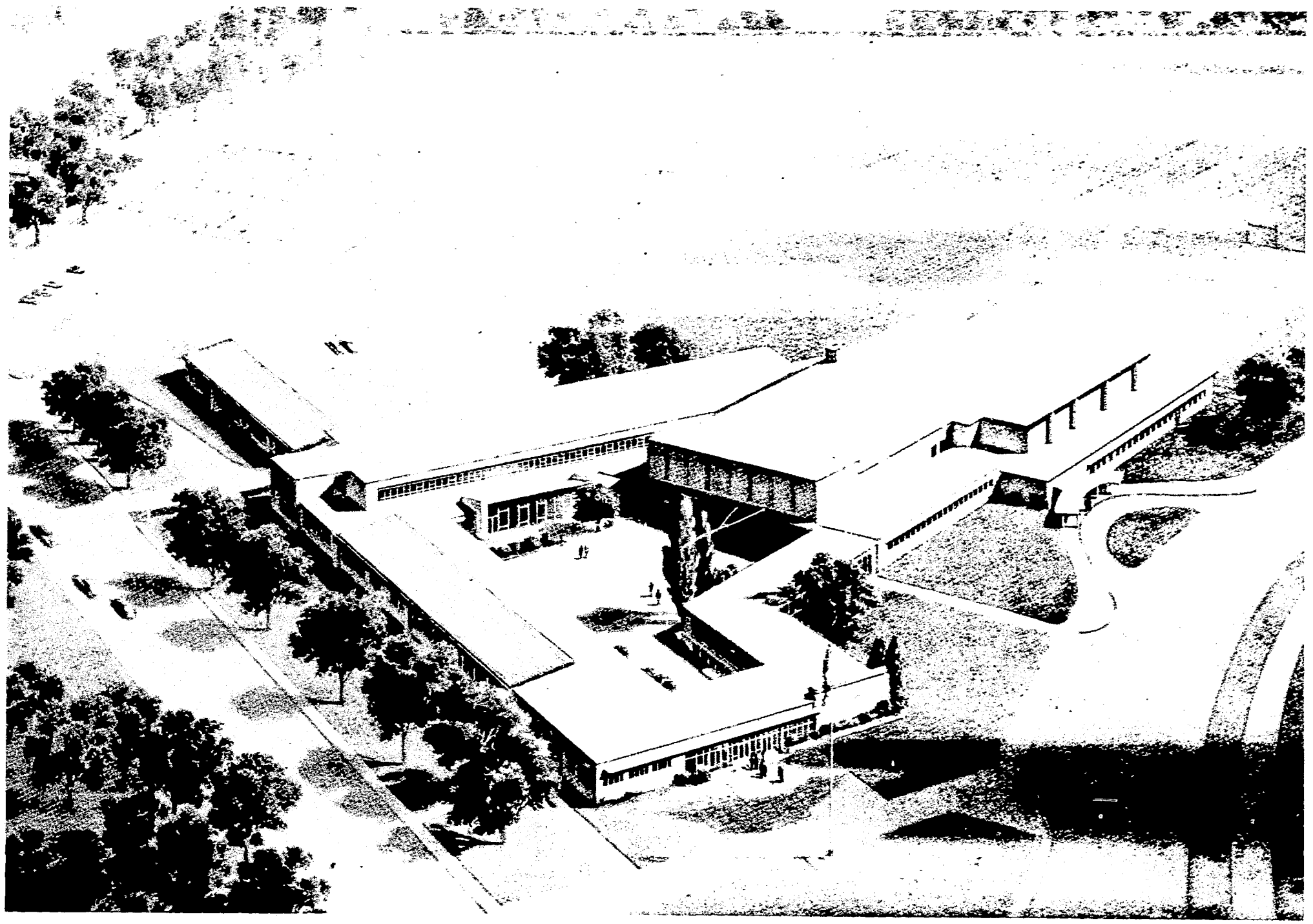
The buildings should be placed on the grounds so that they are sufficiently removed from roads and streets to minimize traffic noises and hazards. In order to assure high functional value for grounds for play and other outside activities, it is necessary to locate buildings so as to permit the maximum utilization of the entire area and not interfere with activities. For example, placement of a building in the center of a site might interfere with adequate layouts for ballfields and other recreational areas.

The designer should masterplan the school plant so that outdoor areas can be treated to produce desirable interior environment. The position of the building on the grounds, orientation, trees and shrubs all may influence visual,



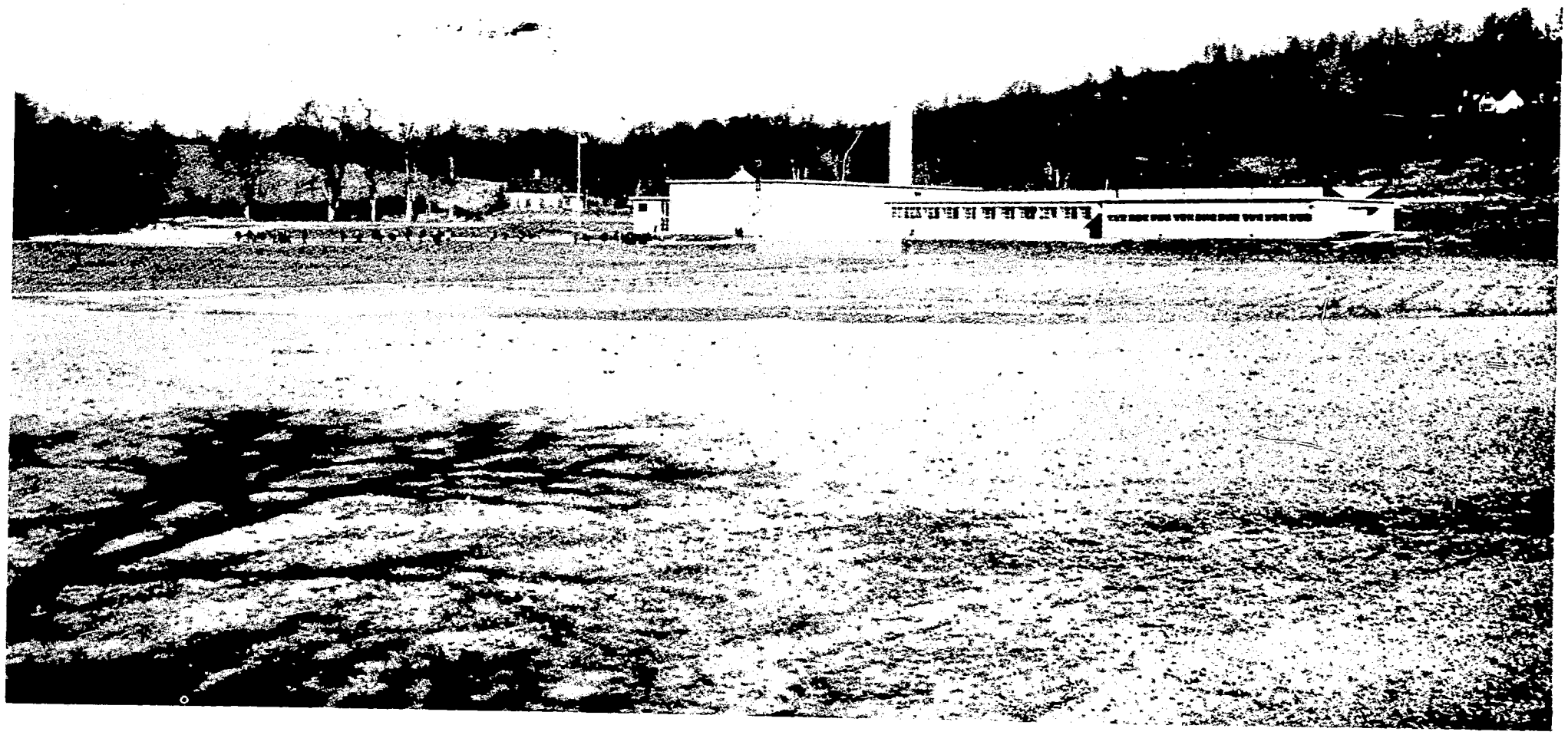
RAMSEY JUNIOR HIGH SCHOOL AND ELEMENTARY SCHOOL, FORT SMITH, ARK.

This is a good example of joint use of two schools on a large site located away from congested traffic and noise.



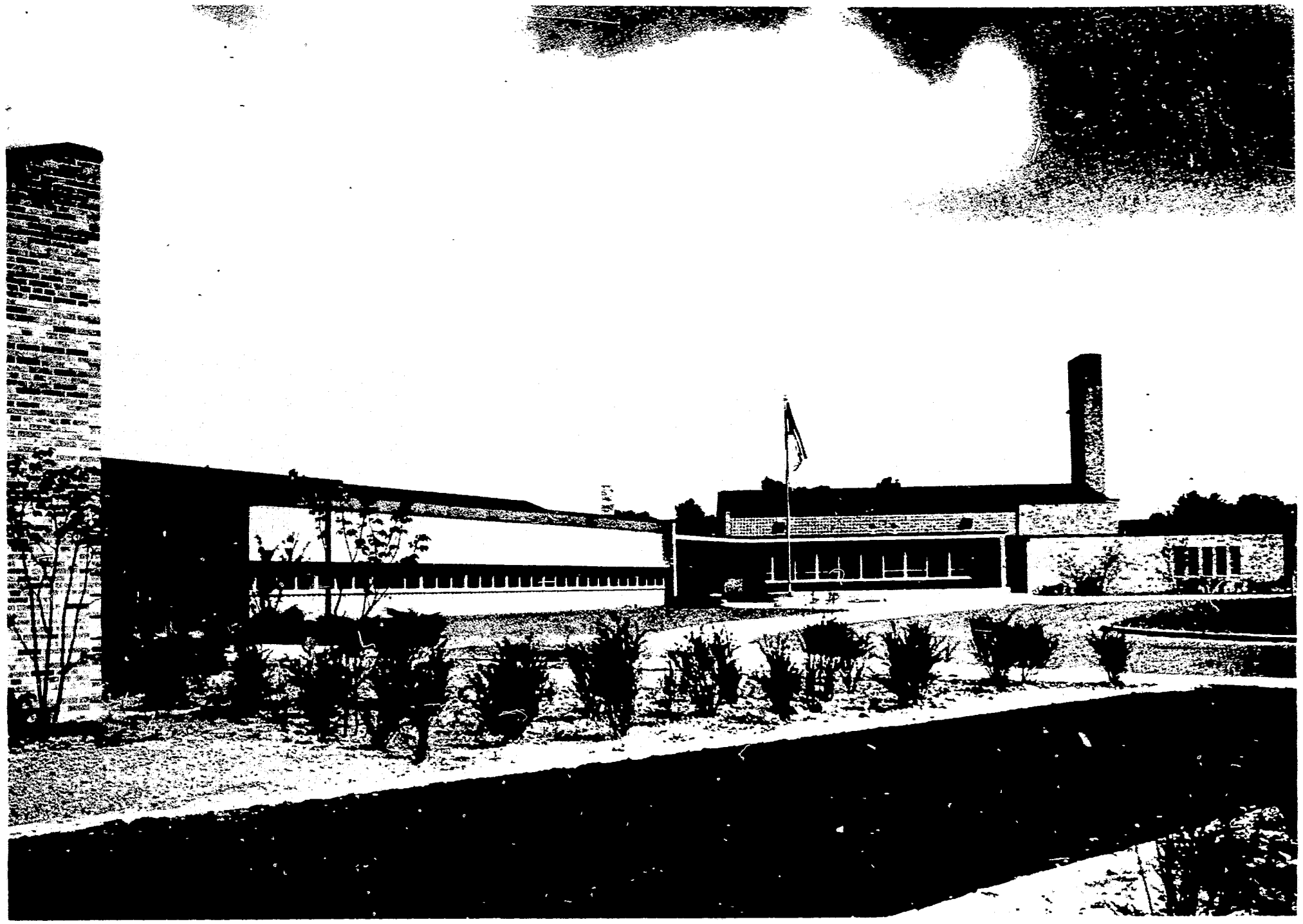
GARDEN CITY HIGH SCHOOL, LONG ISLAND, N. Y.

Location convenient to streets; does not interfere with playground areas.



MEMORIAL SCHOOL (Grades 6–8), MIDDLEBURY, CONN.

Building is located on slightly elevated ground, and does not interfere with playground.



BROOKSIDE ELEMENTARY SCHOOL, GRAND RAPIDS, MICH.

This view indicates logical landscaping with appropriate plantings.

thermal, and auditory conditions in the building. If the best results are obtained, the site development planning cannot be put off until the building planning is completed or the building erected. Planning a school plant cannot be fragmented and at the same time have the full advantage of spatial approach to planning.

In many school systems today school boards have a definite policy on the ultimate capacity of new plants. Where such a policy is in effect, the designer can produce a plan which indicates total facilities required when enrollment reaches its maximum. Where such functional planning is done, there should be no problem in expanding facilities of the plant.

It is quite desirable that the school site have an elevation somewhat higher than surrounding land. Such land gives a length of view restful to the eyes of pupils, diverts falling water on surrounding ground from overflowing the grounds, and simplifies the drainage problem. The buildings should, if possible, be located on a slight rise, so that the ground will slope away from the building. Such a natural elevation might save the school extra expense for footings and special drainage and eliminate the temptation to raise the first floor above the ground level, which may create problems should it be necessary to expand the building.

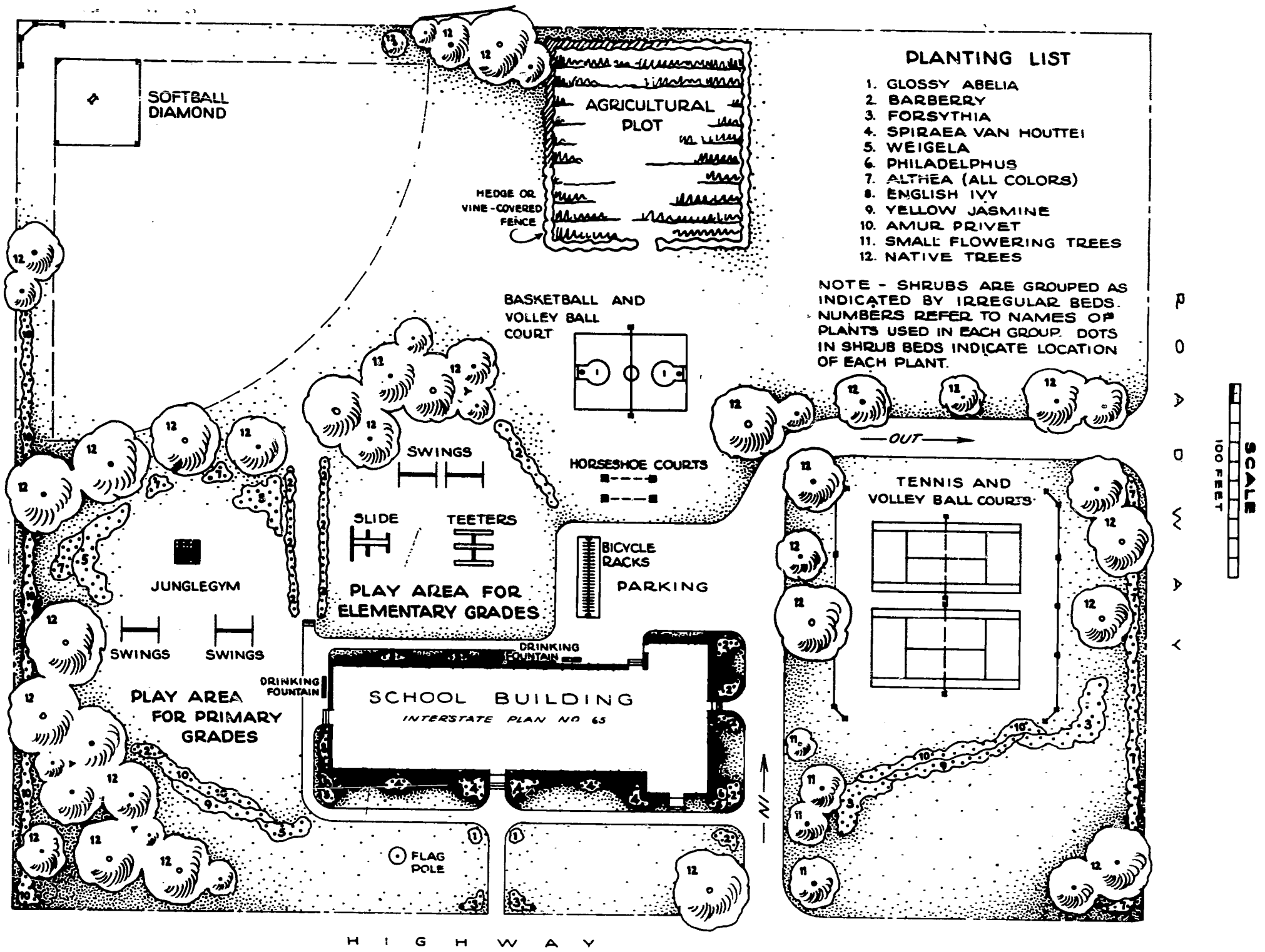
A good plan on site development can save school construction funds without impairing the usefulness, safety, or attractiveness of the finished product. For example, a logical placement of buildings on the grounds may save a large amount of money for unnecessary excavations and foundation walls. The architect should advise with the school board on how to fit the buildings to the contour of the land. Construction funds may be saved by taking advantage of the proximity of utility and drainage lines and by placing the building on the grounds so that long and expensive walks and drives will not be necessary. Logical placement of buildings may also save on maintenance and operation expense. For example, steep banks should be avoided because they may cause erosion, divert surface water to the foundation of the building, or cause damage to drives and parking lots. Repairing such damages could be very expensive.

Facilities should be so arranged that they will be functional and convenient for pupils, teachers, and the public. Service drives should be short, if possible, and convenient to storage rooms, shops, stage, and other places to which deliveries must be made. Playgrounds should not be too near buildings but within reasonable distances of the exits of the building. Public use of the indoor facilities will affect the overall site plan, and thus the location of the buildings.

Landscaping

School grounds especially affect the public's attitude towards schools, since practically everyone sees the grounds, though many may not have occasion to enter the school buildings. Beautiful, well-kept grounds help to bring the schools closer to the community, but unattractive, ill-kept grounds tend to create a gap between them. If inadequate, ill-kept grounds represent the kind of program carried on in the schools, the public may conclude it is not getting much for its school funds, and certainly the children are being cheated.

School-ground beautification programs may well be a pattern for community improvement movements. Other institutions, including homes, may secure ideas and inspiration for improvement of lawns and grounds. In a small 12-grade school of a central State, a social studies class became interested in beautification of their school grounds.



Suggested landscape layout for a small school, illustrating functional planning for beautification and utilization.

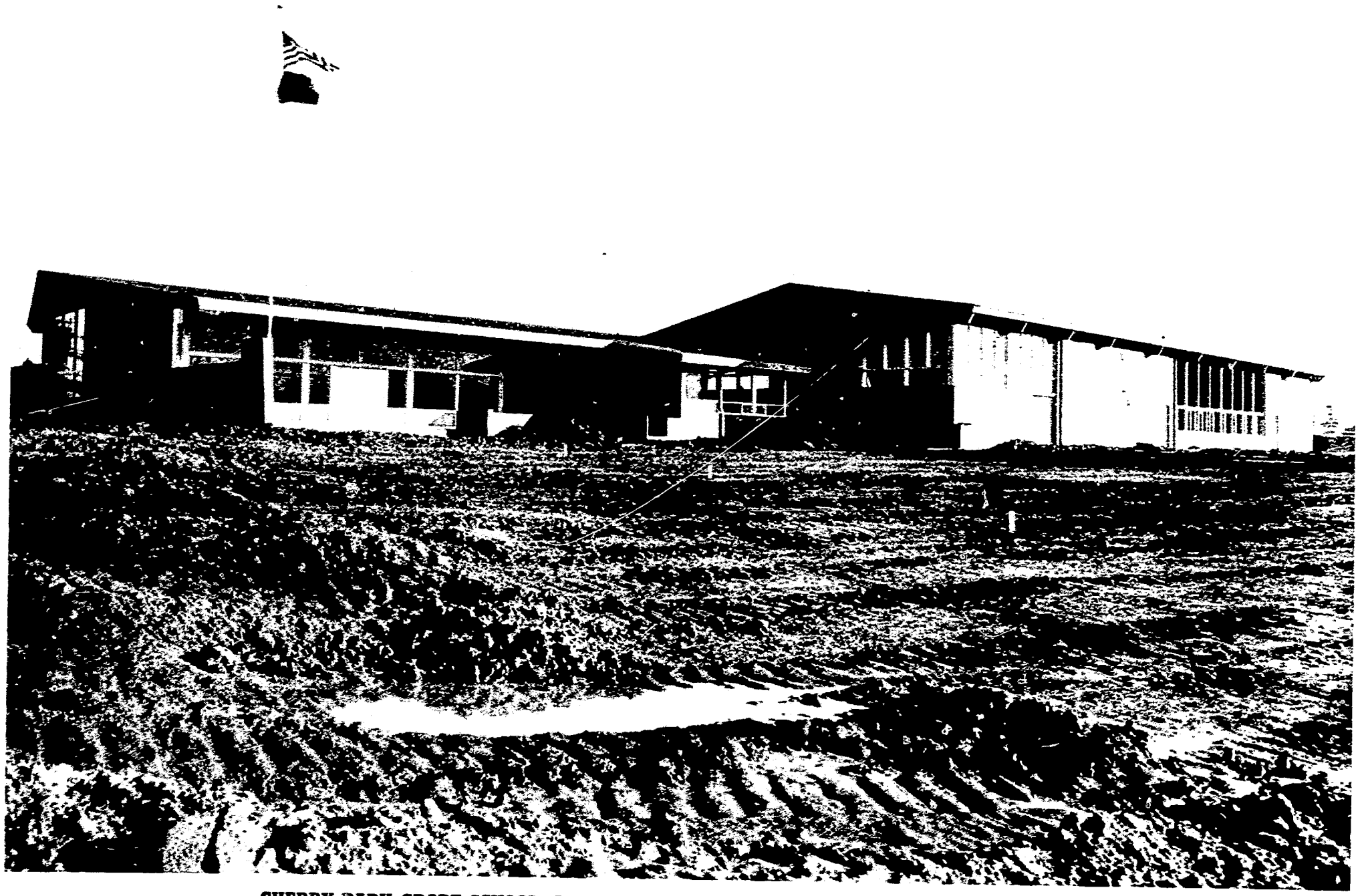
They were particularly interested in foundation plantings around the main building and otherwise placement of appropriate trees and shrubs on the grounds. The instructor, realizing this to be an important learning situation, as well as an opportunity to make the grounds more attractive, encouraged the pupils to invite the State school building supervisor, the county home demonstration agent, and other community representatives to assist the class in such a project. State, county, and community representatives met in the school building with the social studies class for a lengthy discussion of the project. The outcome of the meeting was a complete diagram of an improvement project showing exact location of various types of plants and trees around the buildings and on the grounds. In a culminating activity of the project the school and the community engaged in a Planting Day, under the direction of a landscape specialist. Many of the plants selected were wild, native plants, others were donated from the grounds of homes in the community, and a few were nursery plants. The people of the community proudly watched the trees, shrubs, and flowers on these school grounds grow. The pupils gained valuable experience in cooperative effort, and knowledge of landscaping and of various types of plants. Such experiences and knowledge, no doubt, transfer to future home and community planners and builders.

A school ground planting scheme should generally consist of: (1) Limited conservative foundation planting to tie the building to the ground; (2) intersection planting of hardy shrubs at angles and curves of drives and walks; (3) tall trees to frame the building; (4) trees planted in groves for shade, woodland areas, and special effects. Many schools use a great variety of flowering plants and shrubs which are beautiful during the growing season. Each plant should be used for a specific purpose and should be grouped or associated according to comparable heights, color, textural values, and plant culture requirements. In rural schools, plants from nearby woods may be donated. City schools may have more formal planting, made up of broader assortments of horticultural varieties. Destruction of large shade trees and other natural plants should be avoided unless they obstruct the skylight from classroom windows, interfere with play space in playgrounds, or shade gardens or agricultural plots. To save desirable trees, walks and drives may even be curved around them. Long rows of native trees along the border of grounds about 40 feet apart, or nearer together for shade, are often desirable.

Grading is usually tearing up and reshaping the site to a series of horizontal planes and thus preparing the base for surface improvements. This facilitates drainage, provides appropriate bases and surroundings for buildings, corrects conditions for special usage to which the graded areas are to be devoted, and improves appearance.

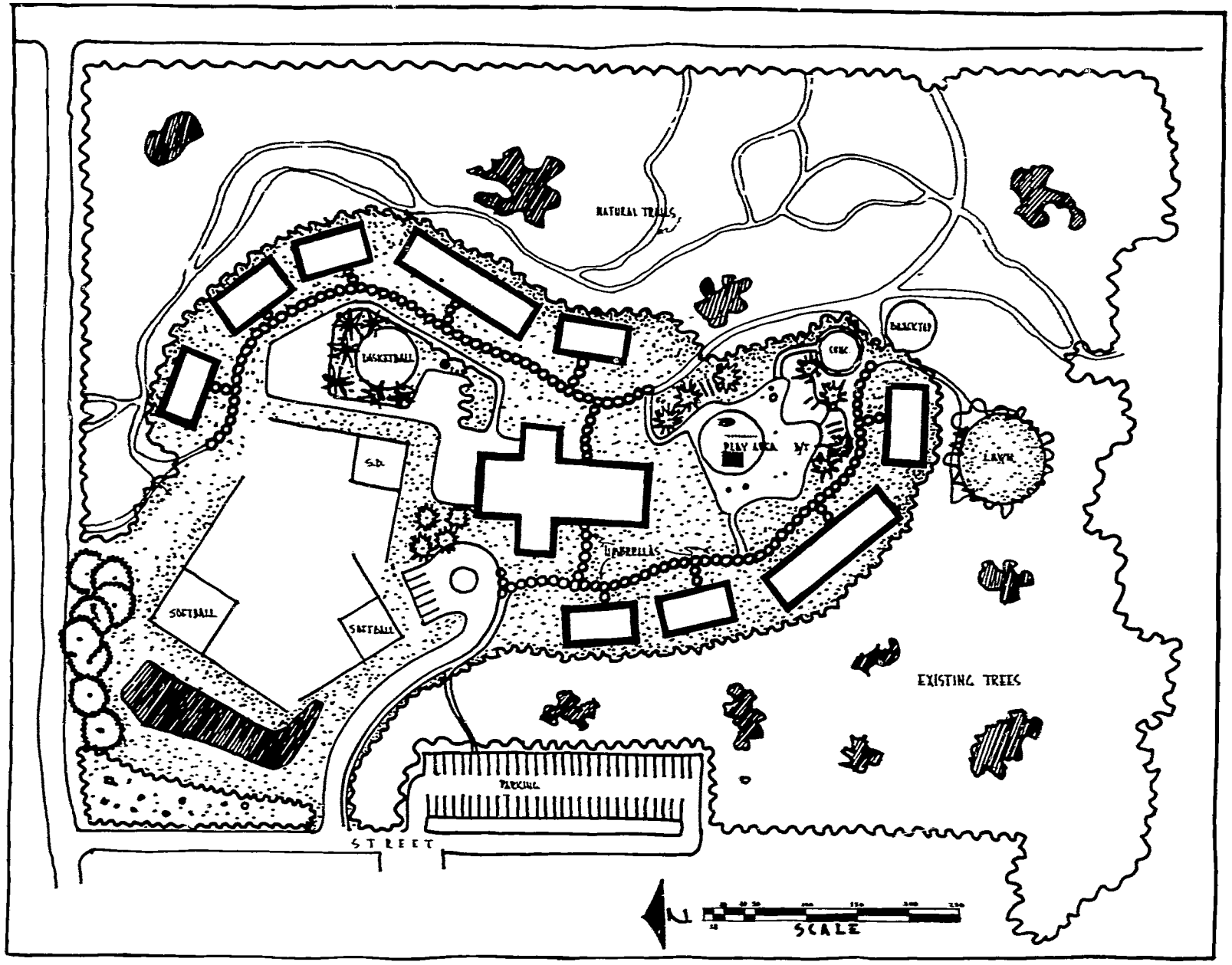
Before grading operations start, the school can save money and labor by stripping off topsoil (even soil under the building area) and stockpiling it for later re-use on lawn, playfield, and planting areas. This procedure, often overlooked in the building process, is one of the largest "moneysavers."

The kind of topsoil has been mentioned as an important criterion in site selection. Where the soil is fertile and conducive to the production of grass and plants, site surfacing in the site improvement program for ball fields and other grass-covered areas is much more simple than where the soil must be fertilized. Where drainage is poor, cinders or tile under the topsoil will help. A water sprinkler system and a good fertilization program for grass greatly increases its ability to withstand playground wear and tear. Selection of a strain of grass should be determined by the weather, the locality, and the use to be made of the ground.



CHERRY PARK GRADE SCHOOL, RUSSELVILLE SCHOOL DISTRICT, NEAR PORTLAND, OREG.

Site grading—land slopes away from building.



HEMLOCK AVENUE ELEMENTARY SCHOOL, GARY, IND.

This layout illustrates a plan which saves existing trees.

The U. S. Department of Agriculture is a source for reliable information on grasses and their culture.

Perennial vines that will endure many years should be planted where their growth will add to the beauty of the grounds. Quick effects are secured by planting annual vines for a single season, but eventually perennials should be used. The following is a partial list of vines suitable for school grounds: Honeysuckle, English and creeper ivy, jasmine, morning-glory, virgins-bower, and wisteria.

Schools anticipating ground beautification and not able to avail themselves of a landscape architect should get in touch with local botanists, State agents in plant industry, county agricultural and home demonstration agents, State colleges and universities, highway engineers, and nurserymen. Following is a partial list of shrubs suitable for school grounds: Abelia, althea, boxwood, butterfly bush, crape myrtle, deutzia, forsythia, Japanese barberry, jasmine, lilac, nandina, philadelphus, pomegranate, privet, quince, spirea, witch hazel, and wigelia.

Many schools have planted shrubs, trees, and lawns on *front* areas, but have neglected the *back* area and the spaces between classrooms and playfields. Even a small lawn area with a few trees helps to break up what is often an unsightly and unattractive portion of the school grounds. Time and energy should not be devoted exclusively to the front school areas.

Activity Areas

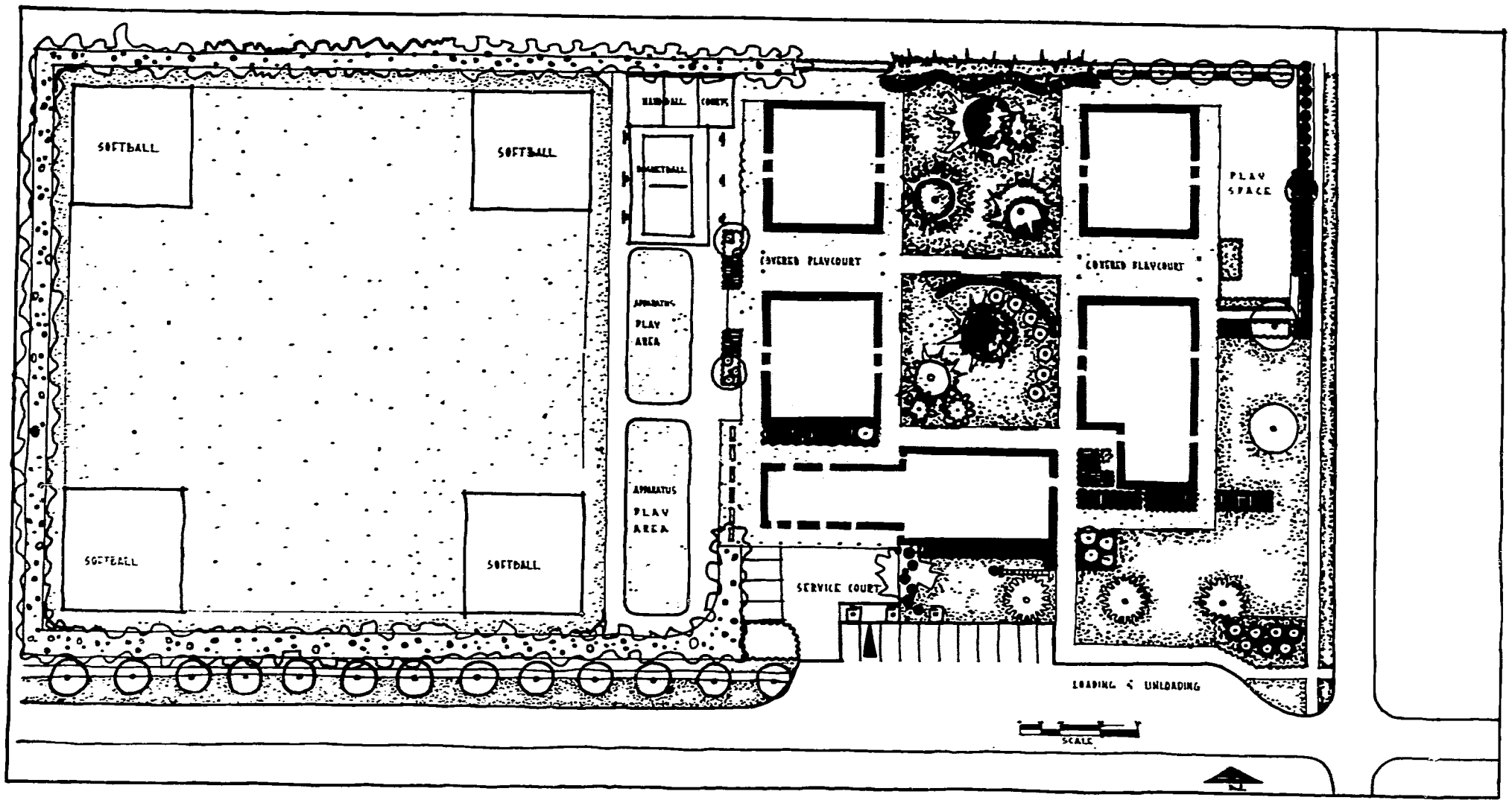
Basic activities in physical education, athletics, outdoor study, and meetings with their implications for space and facilities are described in section III. With all the outside activity in today's program and tomorrow's anticipated changing program, school sites obviously must be larger than those selected for schools a generation or two ago.

At the risk of setting standards, specialists in health, physical education, and recreation have suggested dimensions for areas for sports and games commonly used in schools and community recreational programs. The specialists, realizing that the size of areas varies with age of pupils, suggest different dimensions for the elementary, upper grades, and high-school levels. Such dimensions of areas for two different games are helpful for planners at the local level, not only in site selections but also in the development of functional school grounds. In this discussion of activity areas no attempt is made to prescribe the curriculum in outdoor school activities. Local interests and different age levels will determine what is needed. In most schools a wide variety of outdoor activities will require space for many of the games listed in table 8. Some activity areas on school grounds may accommodate two or more seasonal sports.

Areas for playground apparatus and equipment should be separated according to age groups and the type of activities to be carried on. Equipment such as slides, swings, and climbing sculptured structures may be clustered for one age group; climbing and turning bars at another location for a slightly older group; and volley and basketball courts on a multiple-use area. Other equipment required for primary children needing space include benches, horizontal ladders, seesaws, standard playground slides, swings with safety seats, and tables and seats.

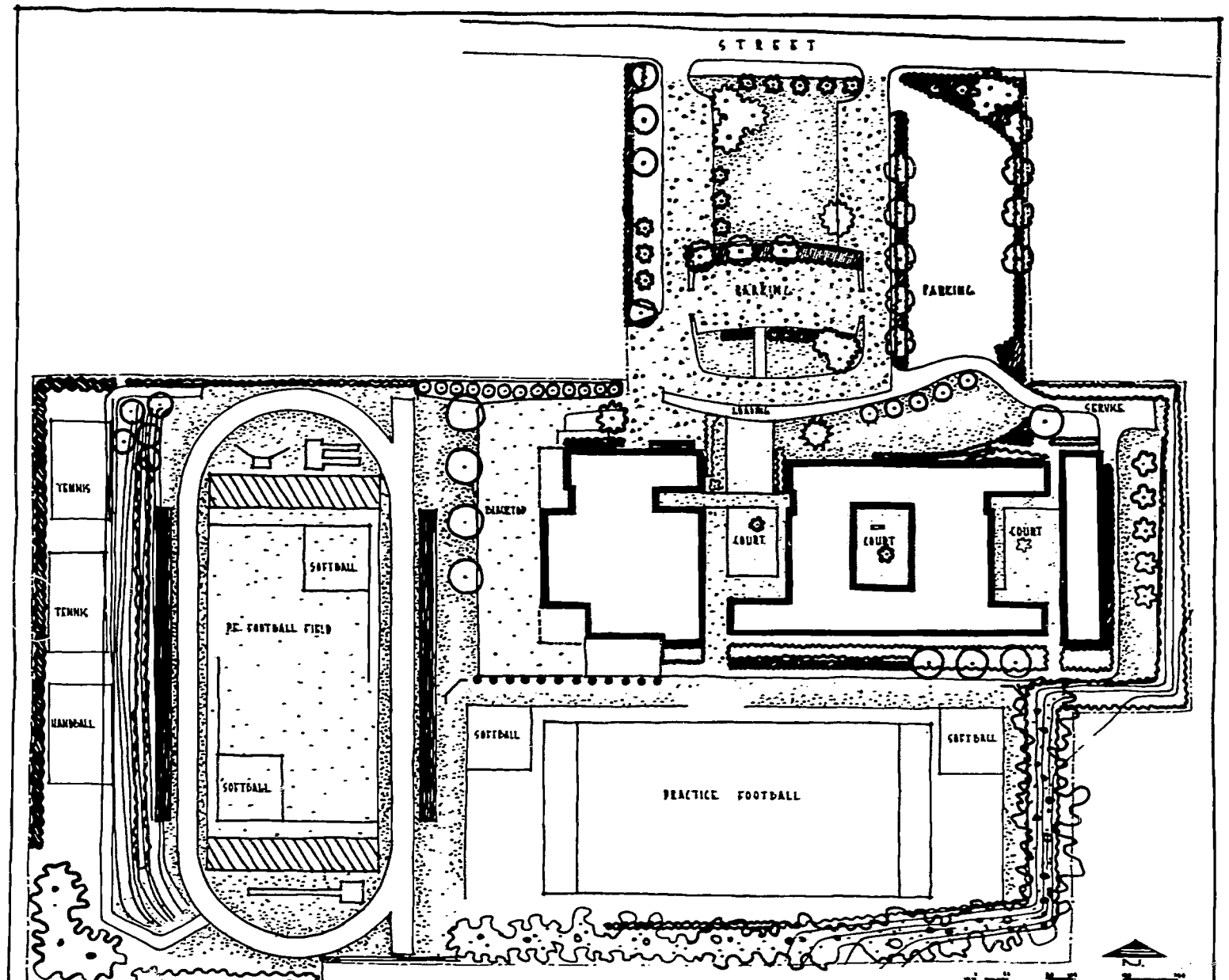
For upper grades there will be space requirements for equipment such as balance beams, climbing structures, horizontal ladder, horizontal bars, seesaws, slides, swings, traveling rings, climbing ropes, merry-go-round, parallel bars, and giant stride.

A multipurpose area may be combined with field-game areas. It should be located away from high activity and noise. It may include open turf, benches, and tables.



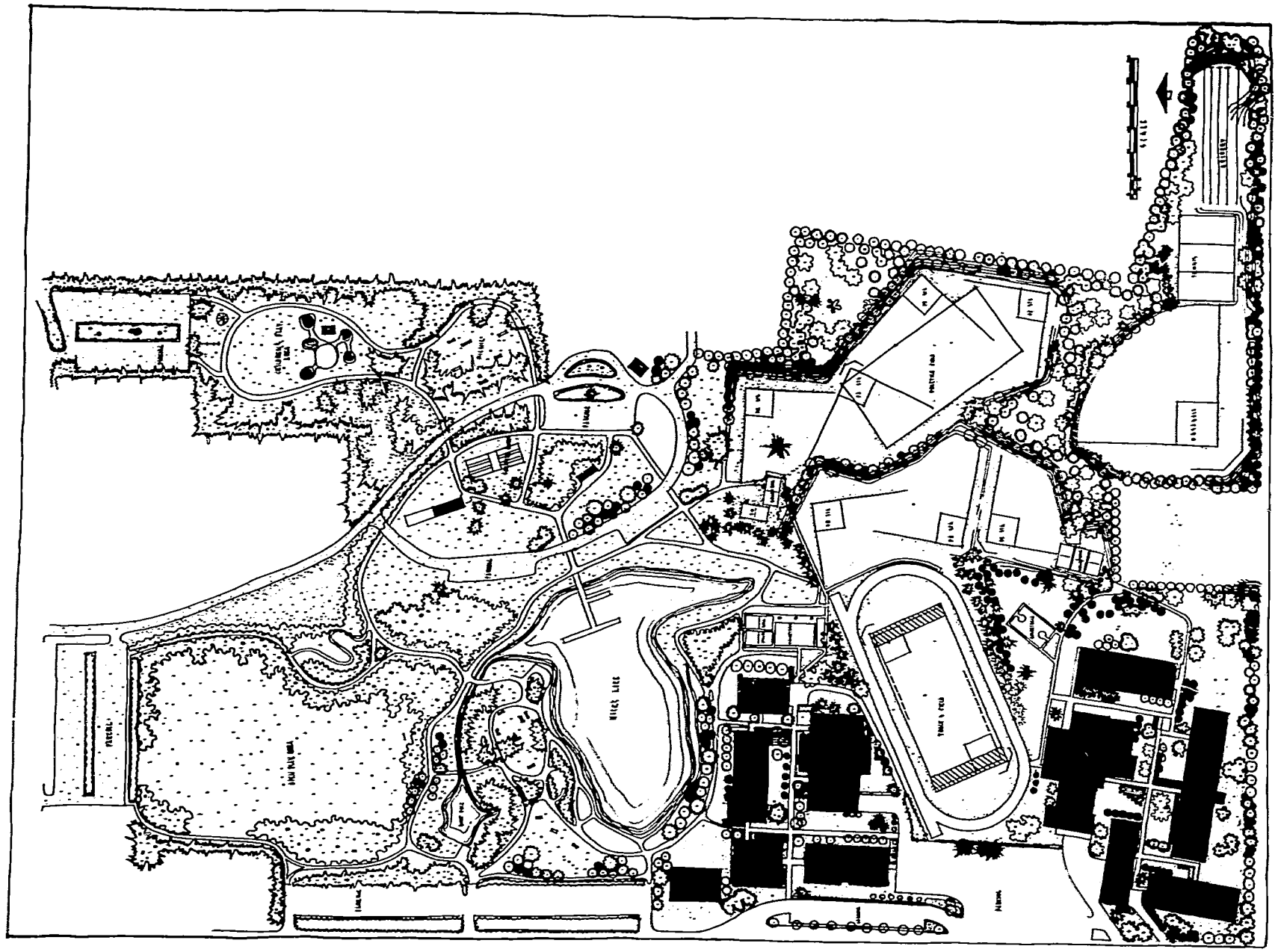
BROOKDALE ELEMENTARY SCHOOL, TACOMA, WASH.

Logical arrangement of play areas and plants in open courts. Note covered play courts for use in inclement weather.



OLYMPIC JUNIOR HIGH SCHOOL, SEATTLE, WASH.

This illustrates landscaping for beautification without interfering with play areas. Football field is also used for softball.



LAKEWOOD JUNIOR AND EVERGREEN SENIOR HIGH SCHOOL, SEATTLE, WASH.

This site layout accommodates two schools with some areas used jointly.

This area may be used for games of low organization, classwork, and creative play. Courts used for games such as basketball, volleyball, badminton, tennis, and shuffleboard should have removable net posts so that one area may be used for two or more games. Courts are usually oriented in a north-south direction.

Horseshoe courts on school grounds should be protected by a fence or a low pipeline. Pitching stations should be constructed 10 feet apart and the targets oriented in a north-south direction. Shuffleboard is played on level, hard-surfaced areas. There may be a battery of courts with a trough between them.

Archery facilities on school grounds should be located so that stray arrows do not prove hazardous. Targets in such areas may be built-up embankments, or located on the side of a hill with 30- to 40-yard clearance around them. A site for an archery field simulating actual hunting conditions during and following school years should be located in a wooded area and have rolling terrain fairly well isolated.

Some schools include handball in recreation and physical education programs. Courts made of reinforced concrete, designed so as to be playable from either side, have almost entirely replaced the early wooden courts. The front wall of handball courts is reinforced concrete, 16 feet high and 8 inches thick. Other dimensions of such courts may be found in table 8.

Skiing is becoming more popular. Many schools are giving basic instruction in skiing because it is a sport pupils can enjoy as a leisure-time activity in resort areas after graduation. Classes of 25 to 30 for beginners may be taught on a course made on a gentle, short slope with a relatively large, flat run-out area. For advanced pupils, classes are much smaller and they need steeper, longer hills. Flat-top areas should be as much as 50 square feet per skier. The drop in grade should be about 4:1, and the starting line about 100 feet wide. The slope should face east or northeast. The areas should be free of stones and should have protection, such as trees and brush. For advanced classes, the slope should be about 3:1, 100 to 150 feet long, and 150 feet wide.

Facilities for instruction in golf, a sport which carries over to adulthood, should be considered in school site development. Many schools use a community golf course. Minimum facilities for golf instruction would be space for practicing approach shots, a driving cage, and a putting green. If a driving range is needed, it can be arranged on a football field.

Many school grounds, and especially those connected with community parks, provide picnic areas to accommodate a single family or large groups. Accommodations in such areas should be determined by the number of people who may wish to use them at any given time and the type of activity to be carried on. The design of such an area should be given careful study in relation to its potential use for various activities.

In some park-school situations an area can be set aside where older adults may congregate for conversation, lounging, quiet games, and general sociability. A shaded area is desirable; otherwise, some form of shelter should be provided. Benches and tables are necessary equipment for this area.

Gardens on school grounds should be developed not only to provide enjoyment in school ground beautification but to have a cultural and educational value. There are usually three types of gardens: The demonstration garden, group-production garden, and the individual-plot garden. The demonstration garden is a small area conducted by the teacher and class groups on the same basis as a laboratory. The group-production garden, often conducted as a cooperative project to produce crops, may be large or small.

The individual-plot garden, a sizable area of land, is divided into small plots and assigned to individual pupils. Areas for school gardens should have drainage and facilities for irrigation, if needed, should be fenced, and be provided with adequate storage facilities for tools and materials used in the project.

Table 8.—Dimensions for Game Areas [1]

Type of game	Elementary	Upper grades	High school	Area size (square feet)
1	2	3	4	5
Basketball	40′ x 60′	42′ x 74′	50′ x 84′	5,000
Volleyball	25′ x 50′	25′ x 50′	30′ x 60′	2,800
Badminton	.....	.....	20′ x 44′	1,800
Paddle tennis	.....	.....	20′ x 44′	1,800
Deck tennis	.....	.....	18′ x 40′	1,800
Tennis	.....	36′ x 78′	36′ x 78′	7,200
Ice hockey	.....	.....	85′ x 200′	17,000
Field hockey	.....	.....	180′ x 300′	54,000
Horseshoes	.....	10′ x 40′	10′ x 50′	1,000
Shuffleboard	.....	.....	6′ x 52′	648
Lawn bowling	.....	.....	14′ x 110′	7,800
Tetherball	10′ circle	12′ circle	12′ circle	.....
Croquet	38′ x 60′	38′ x 60′	38′ x 60′	2,275
Handball	18′ x 26′	18′ x 26′	20′ x 34′	1,280
Baseball	.....	.....	350′ x 350′	122,500
Archery	.....	50′ x 150′	50′ x 300′	20,000
Softball (12″ ball) [2]	150′ x 150′	200′ x 200′	250′ x 250′	62,500
Football—with 440-yard track—220-yard straightaway	.....	.....	300′ x 600′	180,000
Touch football	.....	120′ x 300′	160′ x 360′	68,400
6-Man football	.....	.....	120′ x 300′	49,000
Soccer	.....	.....	165′ x 300′	57,600

[1] Athletic Institute, Inc. *Planning Facilities for Health, Physical Education, and Recreation.* The Institute, 209 South State St., Chicago 4, Ill. 1956. p. 26.

[2] Dimensions vary with size of ball used.

Stadium

Some secondary schools construct stadiums which provide not only a playing field for football games and track events, but seating capacity for crowds of spectators sometimes up to 10,000 capacity. Seating capacity for such structures can be justified more readily if they have multiple use. In addition to serving athletic contests, these facilities are used for patriotic observances, plays and pageants, Easter sunrise services, conventions, commencement exercises, demonstrations, exhibits, parades, drills, and band concerts.

The space underneath the stadium may provide physical education service and activity areas, such as dressing units, classrooms, rifle ranges, and bus storage. Such facilities should supplement rather than duplicate existing units. Large school systems with several high schools do not attempt to provide a separate stadium for each school but construct one stadium for use of two or more schools for athletic and other spectacular contests. Those responsible for planning stadiums should keep in mind that their creation is an integral part of the physical education, health, recreation, and athletic programs, and not divorced from them.

Swimming Pool

Swimming is one of the most valuable activities in physical education and recreation programs. Since it holds such a high place in physical education, plans for many new schools include swimming facilities for instruction and recreation. In two separate studies conducted 20 years apart by William Ralph La Porte, of the College Physical Education Association, the following conclusion was reached: "Of all the activities in the physical education curriculum, swimming is foremost in benefits for the individual and group." [1] Activities commonly carried on in a school or a school-community pool include general recreational swimming, swimming instruction, lifesaving instruction, diving, water games, and school physical education classes.

Before determining to build an outdoor pool, the school should study such factors as weather conditions, environment, existing swimming facilities in the area, types of activities which the pool should provide, age, size, and number of individuals to be accommodated, estimated potential use of the pool, its optimum size to meet program needs, availability of a suitable site, estimated construction cost, estimated operating cost and probable income, and life expectancy of the pool.

The size of the site selected for the outdoor pool will depend on the type and enrollment of the school and whether or not it is a joint community-school facility. In Austin, Tex., the school board and the municipal recreation board buy sites for a park-school project jointly, especially for elementary schools. The swimming pool is located so that it is convenient for school use as well as community use during the summer months.

Before locating the pool, a study should be made of prevailing winds and airborne contaminants. Winds may be controlled by screening with properly placed trees, buildings, canvas, or other similar devices. One or more walls of the gymnasium may serve as windbreaks. Thus the exact location of an outdoor swimming pool on the school ground site must not only integrate with the school itself but also with the environment of the school. Care should be taken to locate the pool so as to avoid water seepage.

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[1] Neilson, Donald W., *and* Nixon, John E. *Swimming Pools for Schools.* Stanford University Press, Stanford, Calif. 1956. p. 2.

The outdoor pool may be an independent structure or may be related to existing or planned school buildings. Fences around the pool should be 8 feet high for a single type and 6 feet high for the double type with planting in between.

Indoor-outdoor pools have been built in several cities. Such flexible facilities possess the advantage derived from outdoor sun-bathing and indoor protection from weather elements. Attendance at such pools shows an increase over that for indoor or outdoor pools of comparable size. A novel plan for an indoor-outdoor pool is the California all-weather type, which has a movable roof that permits opening or closing as changing weather conditions dictate. Another plan is to construct the walls of the enclosure of a pool so that they are movable, thus making it possible to open them in warm weather onto a large deck, to get outside effects.

The rectangular pool is less expensive and simplifies supervision, but it restricts competitive activity and limits instructional stations. L- and T-shaped pools reduce danger, especially in diving, provide more instructional areas, more deck space, and a greater value in swimming area for expenditures. But they require more space, more supervision, and competitive swimmers complain that wave action creates a handicap.

Dimensions of swimming pools vary with type of school, enrollment, and program to be carried on. The Florida State Department of Education prescribed the following dimensions for T- or L-shaped pools: One axis should be 75′ x 42′ with a minimum depth of 3 feet at the shallow end and 10 feet at the deep end under the diving boards. A width of 42 feet provides six 7-foot lanes for competitive swimming.[2]

[2] *Facilities for Physical Education.* State Department of Education, Tallahassee, Fla. 1954. (Bulletin 13A.) p. 43.

In some schools the maximum depth of pools for primary children is 3 feet with a minimum of 2 feet for safety. Swimming teachers express the desire to have 80 percent of the pool area less than 5 feet deep. This provides greater instruction area as well as safety for beginners.

Experience has shown that wide decks contribute to the safety, comfort, and enjoyment of bathers. Unless the surrounding area slopes away from the deck, a curb should be installed to prevent surface water and dirt from being washed into the pool.

Every pool should have a workroom, preferably raised above the pool deck level. It should include a first-aid station, desk, shelves, telephone, public address outlet, and additional storage space.

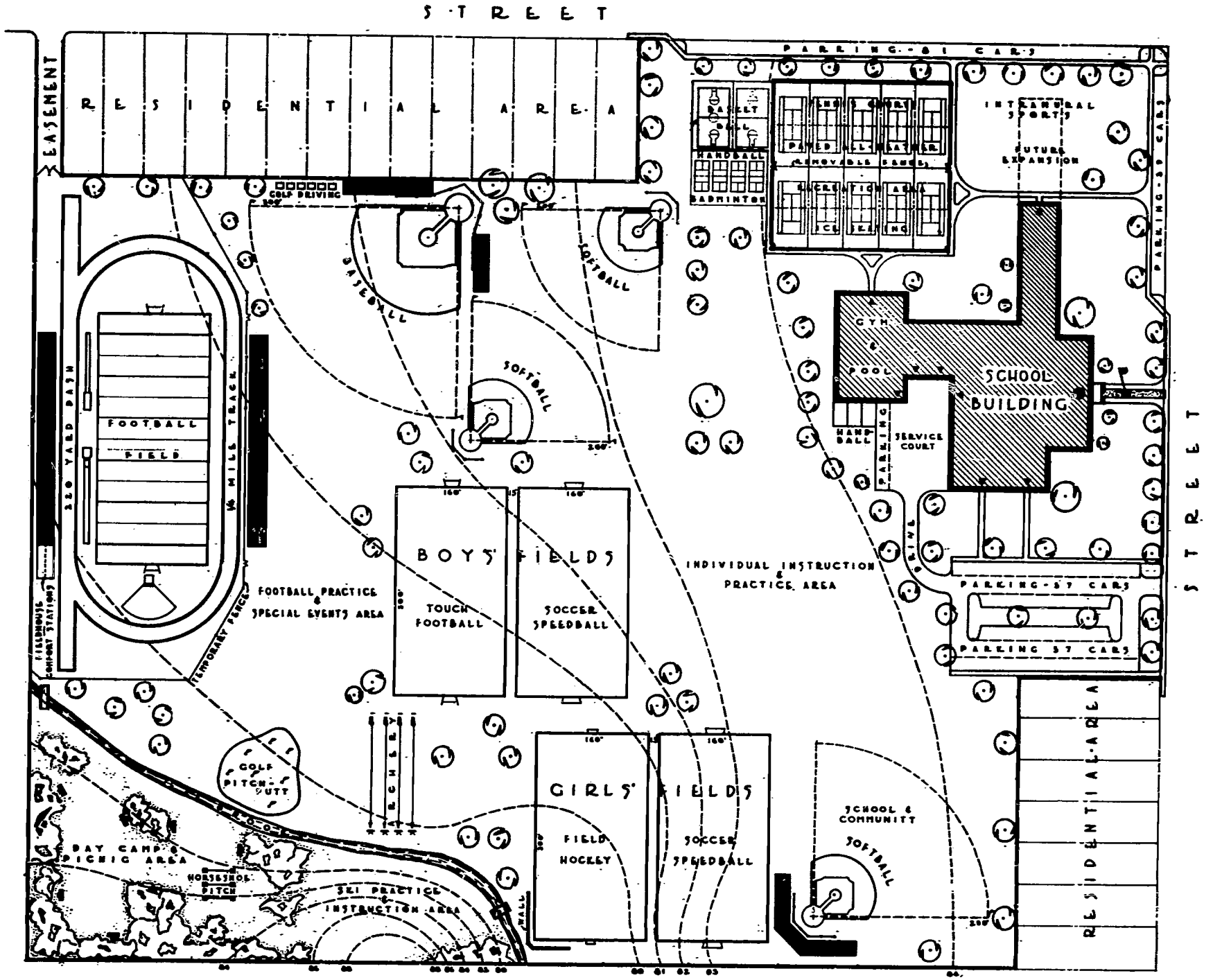
Schools in some sections of the country heat the water for outdoor pools in order to extend the season for swimming. Other important items which will need consideration in planning and operating a pool are: Dressing rooms and showers, construction materials, overflow gutters, coping, water circulation, filtration and disinfection, and general administrative control.[3]

Layouts

Layouts used in the following pages are not proposed as standards to be copied for use by a local school. They should be helpful, however, to planners as they determine how to plan their own so that they may be used efficiently.

The design of outdoor physical education and recreation areas for community-park schools on page 70 was prepared by the New York State Department of Education.

[3] The Athletic Institute, Inc. *Planning Facilities for Health, Physical Education, and Recreation.* The Institute, 209 South State St., Chicago, Ill. 1956.



Design of outdoor physical education and recreation areas for community-park (senior high) school.

It illustrates how large city schools, where land is difficult to acquire, are cooperating with recreation commissions.

The impact of leisure is so great today in some communities that such joint planning is required for full use of school and community facilities. This plan may extend the scope of the program which permits almost unlimited possibilities for individual and group participation in desirable activities in the out-of-doors for all members of the community. Thus the school and community supplement each other for the enrichment of both.

The illustration on page 73 shows how planners at the local level may design a junior high school site for physical education and recreation. Several features in the layout indicate functional planning, such as (1) Providing for a variety of sports and games, including picnicking and golf instruction; (2) arrangement of multipurpose areas for seasonal sports; (3) logical locations to avoid hazards; (4) planning areas for girls as well as boys; (5) all-weather areas; (6) location of the building to preserve play area; (7) provision for future expansion; and (8) landscaping.

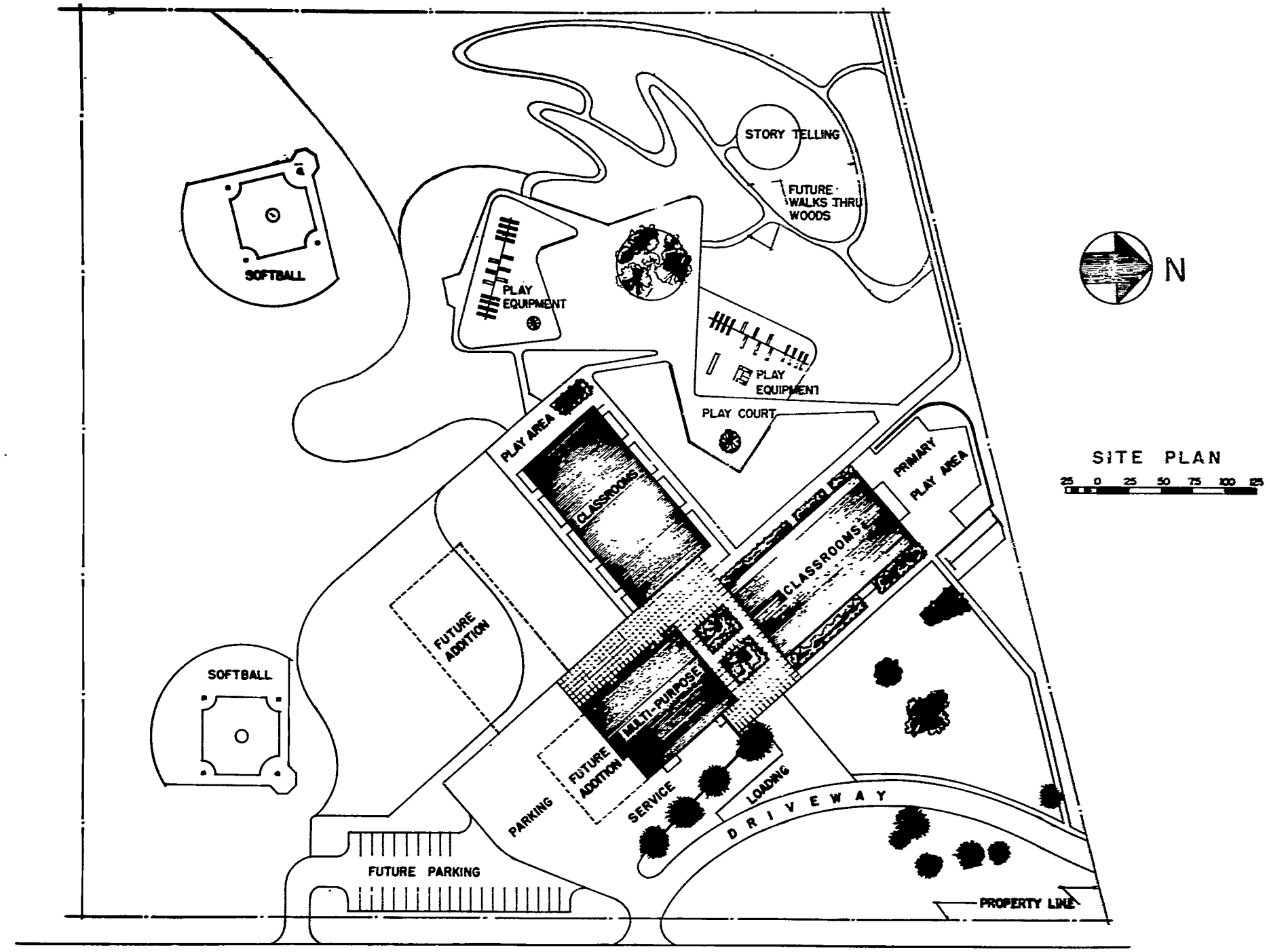
In June 1952, a fast-growing suburban community southwest of Chicago, comprising New Lenox, Mokena, Manhattan, and Frankfort, decided to plan and construct a new secondary school, known as Lincoln-Way Community High School. Since the community was interested in a program of outdoor activities such as athletics, physical education and recreation featuring intramural sports, vocational agriculture, natural science study, gardening, landscaping, community picnicking, and camping, it bought a 70-acre school site centrally located, on U. S. route 30. After the large site was acquired, the planning committee was faced with the problem of putting it to work. The program of activities outlined above to be conducted on the school grounds implied a need for the following activity areas and facilities:[4] A stadium enclosing areas for football, baseball, and track; outdoor basketball courts, tennis courts, softball diamonds, a clock golf course, walled handball courts, volleyball courts, rollerskating courts, horseshoe courts, croquet courts, picnicking grounds, school gardens and orchards, experimental planting areas, grove of trees for biological study, a shelter house, parking areas, lawns, shrubbery, and a flagstaff and base.[5]

A report from the school in October 1957 indicates that the site is efficiently utilized by the school and community. The following outside activities were typical: The FFA shelled and stored 300 bushels of corn raised on the grounds; two groups engaged in a picnic and wiener roast in a fine grove of trees; members of the girls' athletic association camped overnight on the grounds; football and track meets are held on the athletic fields; the girls' athletic association entertained neighboring schools in an invitation meet in soccer, archery, and field hockey. All these games were played at the same time. A dam has since been constructed about 200 yards north of the school to impound water for a lake about an acre in size. This lake will be used for boating, fishing, and biological studies. It will also add to the picnic facilities for the school and community. The development plan is shown on page 74.

The layout on page 72 of the Fort Lewis, Wash., Elementary School shows an interesting site which provides (1) for future additions to the structures as well as site development, (2) primary play area separated from other

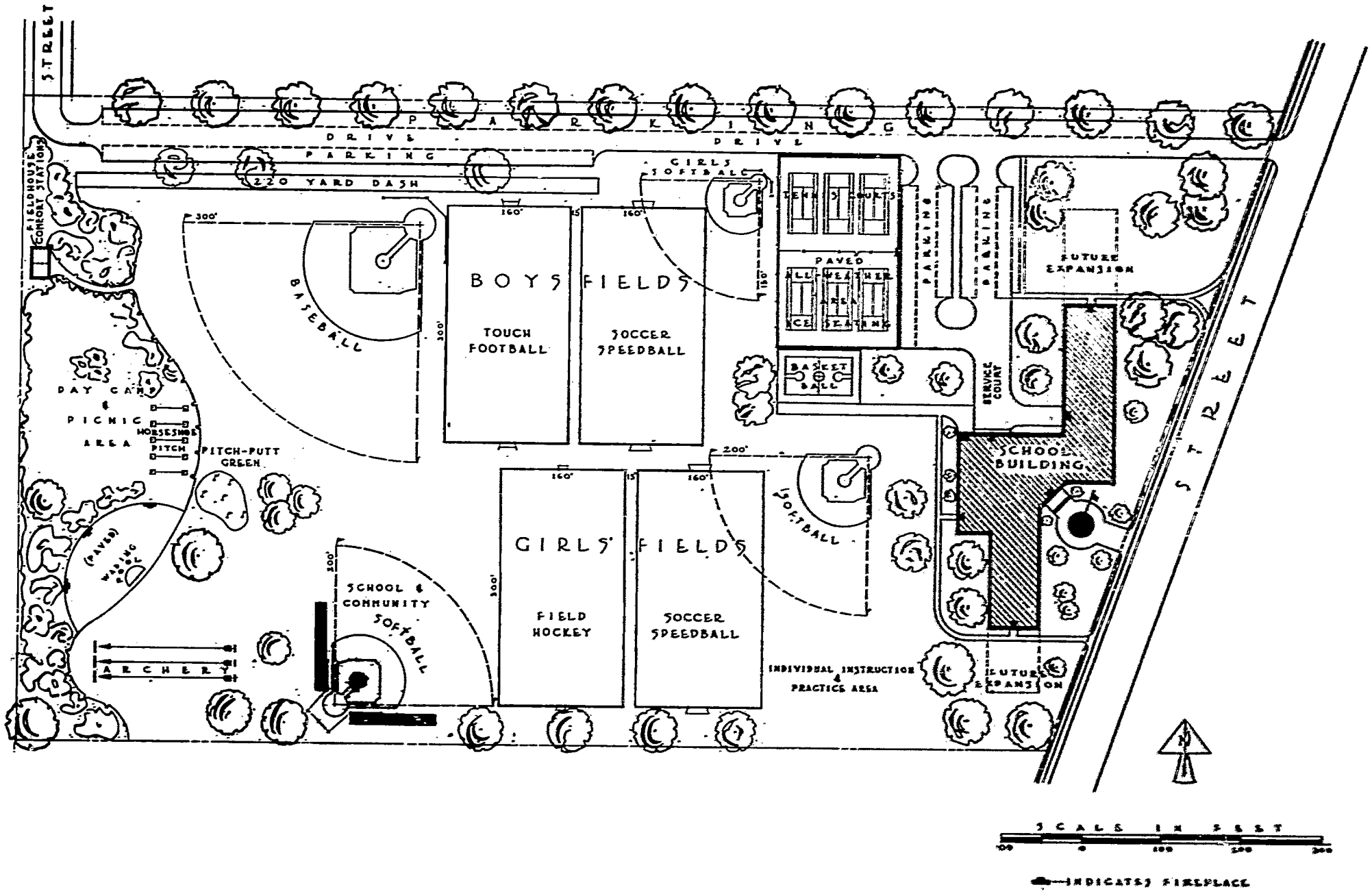
[4] Some of these areas may be combined with others. Multiple utilization of hard-surfaced areas is quite feasible.

[5] Chapman, A. Hunter. The New High School Puts Its 70-Acre Site to Work. *The School Executive*, 75:68–72, Sept. 1955.

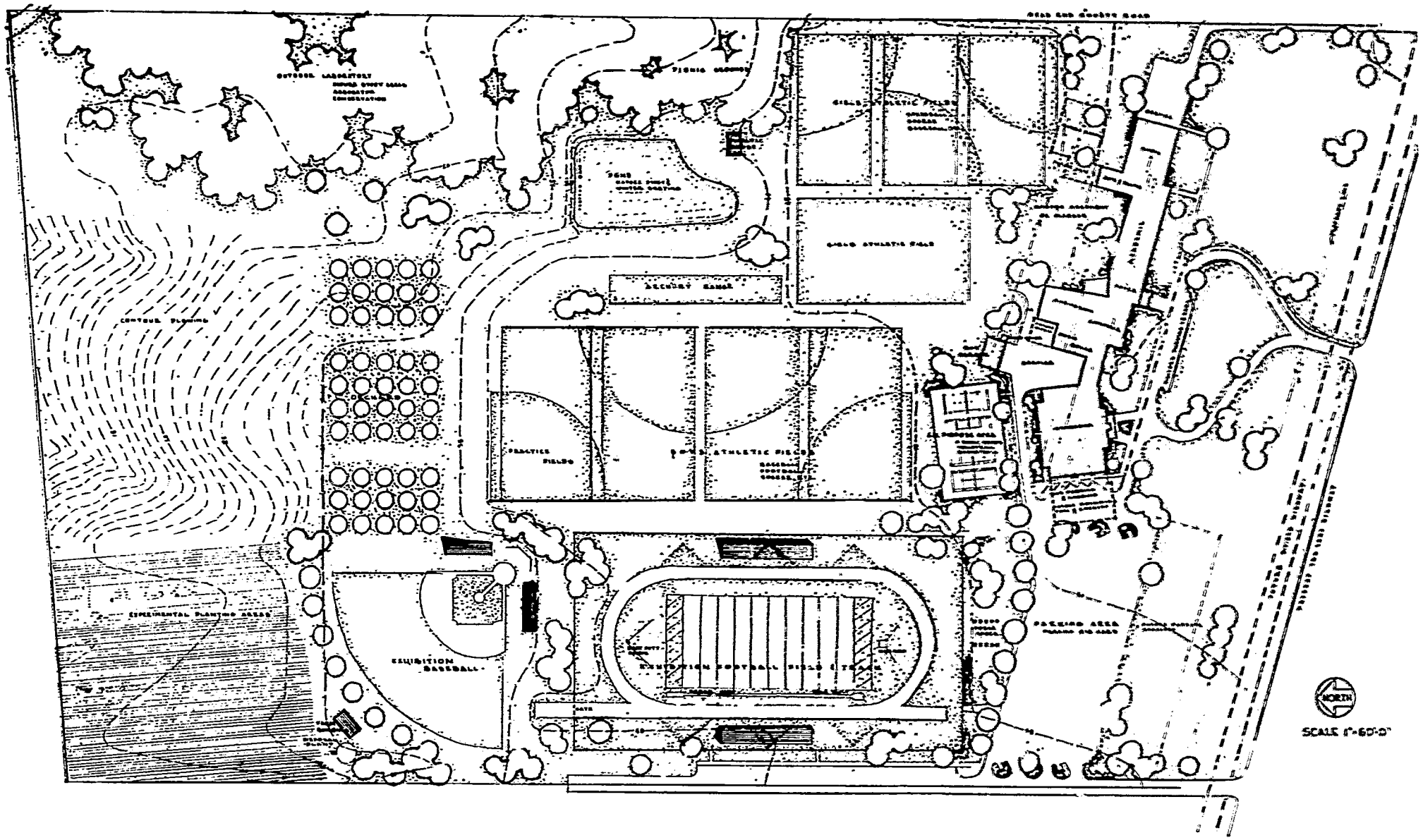


FORT LEWIS ELEMENTARY SCHOOL, WASH.

Site improvement should follow a complete plan which provides for future playground and building expansions.



Design of outdoor physical education and recreation areas for community-park (junior high) school, showing areas for a great variety of activities.



LINCOLN-WAY COMMUNITY HIGH SCHOOL, NEW LENOX, ILL.

This site development plan illustrates a complete plan which would utilize all the area of a large site.

areas, (3) play equipment near buildings, (4) ball fields located away from buildings, and (5) for walks in the woods and storytelling.

Factors To Consider

The following factors should be considered in school site development: Present and future educational program, a master plan before construction begins, planned areas for physical education and recreation, location and orientation of the building and permanent equipment, school-community use, preservation of natural resources as trees, streams, lakes; provision for driveways, walks, and parking for cars and bicycles; surfacing such as sodding and hardtopping, grading and drainage, landscaping to conform to architecture and environment, areas on the site for bus loading and unloading, protection against wind and other inclement weather conditions and against disturbing noise.

VI. SUMMARY AND IMPLICATIONS

Site selection and development is more complex today than in the early history of this country. The school grounds have not always been considered educational tools. They were to provide a foundation site for the structures and had very little if any connection with the school curriculum.

A small piece of land as small as a city block was considered ample area for an elementary school site 50 years ago. One-room rural schools were located on sites of 1 acre or less. Secondary schools sometimes acquired as much as 5 acres but seldom 10.

Many school boards in all States are courageously facing the school site problem. Reports from 34 States, 1958, indicate that many school systems are exceeding State minimums. The minimum sizes in acres have been raised in a revised 1958 edition of the *Guide for Planning School Plants* by the National Council on Schoolhouse Construction.

Selectors and planners of school sites must know the program of outside activities to provide school grounds to fit the program. But there are many factors other than the school activities which influence school site selections, such as community characteristics, population trends, school board policies, educational philosophy, community use, evaluation of present plants, future highways and streets, and State department of education programs of reorganization of local school districts.

To select the sites for new schools, the school board should be armed with organized data that can be readily understood. Certain basic principles or guides should be adopted and used in selecting criteria for site selection and development. It would be impracticable to set up strict standards for school sites for all schools, even though the type and present and ultimate enrollments were known. But the following general characteristics, which apply to all school sites, are helpful: (1) Healthful and safe, (2) functional, (3) economical, (4) attractive, and (5) adequate.

The school site has a significant influence on the school curriculum, community planning, and the attitude of pupils and patrons toward education.

Today's school program includes many activities which are carried on outside the building, such as physical education, athletics, outdoor study of nature and conservation, outdoor assemblies, demonstrations, exhibitions in music, art, science, homemaking, and agriculture.

Those who select and develop the school site should study playground activities of various groups to determine

their requirements for space and facilities. Basic activities in lower elementary grades in physical education are mainly a play program, using playground balls, softballs, bats, and playground apparatus. Such activities are repeated in the upper grades with emphasis on skills in basketball, volleyball, baseball, softball, football, and track and field events. In secondary schools, pupils are instructed in both large- and small-group games requiring fields, diamonds, and equipment for football, soccer, softball, volleyball, basketball, horseshoes, table tennis, archery, handball, golf, tennis, bowling; rhythmic activities, water and winter sports, stunts, gymnastics, swimming, and camping.

Teachers and pupils in nature study and conservation utilize resources, such as soil, water, rocks, trees, shrubs, flowers, and birds. These facilitate outdoor study when they are readily available on the school grounds. The tendency today is to select sites having good natural resources and to conserve them in site development.

High schools offering vocational agriculture require outside space for experimental crops, judging livestock, preparation of meat, poultry, and dairy products for market or storage, reconditioning farm tools and machinery; and participating in national agricultural organizations, such as Future Farmers of America. Driver education, which is increasing in secondary schools, requires both inside and outdoor activities. Many high schools are providing areas on school grounds for practice where pupils actually operate cars before driving on streets in traffic.

School grounds may be the scenes for outdoor meetings of the school, and also for large community meetings. Such meetings may be held in a wooded area, an amphitheater, or in a stadium. These meetings often attract crowds of people, requiring large areas for seating.

Outdoor swimming pools, functionally planned and located on school grounds or in nearby parks, are invaluable assets to the programs of physical education and recreation. These are becoming more numerous with new methods of warming the water and decks and protection from wind to prolong the season.

The park-school idea is used in many cities and metropolitan county school systems. Where land is difficult to acquire, such combinations not only save the taxpayers money but provide better resources for the school and community programs.

Interschool athletics require adequate fields, equipment, and facilities for the participants. Since athletic contests attract large crowds of spectators, provision must be made for seating the visitors and also for parking their cars.

Those who select school sites should keep in mind: (1) Adequacy for the buildings and space for outdoor instruction, recreation, parking, and future expansion; (2) accessibility to pupils and public; (3) availability of utility lines; (4) good drainage and soil; and (5) natural resources for instruction and landscaping. Long-range study and purchase of sites far in advance of need is both economical and educationally sound. It may be economical also to acquire some extra acres in the original purchase.

School boards should avoid the use of suggested minimum site sizes as maximums in selecting school sites. This may result in purchasing sites too small for an expanded program.

The school board has completed important tasks when it analyzes the program and selects the piece of land for the school grounds. But at this stage of planning there is still the all-important task of site development. It is fundamental that site development planning be a cooperative effort and that the planners be guided by a school plant specialist or a landscape gardener. The people who use

the school grounds decide what is needed and the specialist designs the master-plan layout, which should emphasize safety, logical arrangement and location of buildings, activity areas, and landscaping or beautification.

Master-plan layouts will vary depending upon the school and community programs, and the characteristics of the piece of land acquired. Sample layouts are helpful to planning committees in developing their own site improvement specifications. Complete layouts, showing how all the land will be used, are also convincing evidence to school boards and other patrons for adequate sites.

The site-development program should strive for a layout that encourages efficient utilization. Functional planning in playground layouts, for example, may provide for multiple use of certain areas that can be used for different seasonal sports as well as for more than one sport in a season.

Some Commonly Accepted Criteria of a Good School Site

A. Promotes health and safety:

1. Pleasing environment, in a desirable neighborhood, free from excessive noise, smoke, dust, and congested traffic.
2. Suitable terrain for play areas; contour insuring drainage but sufficiently level for group games.
3. Adequate size and shape for play areas, encouraging outdoor activity, avoiding overlapping of areas which might cause accidents.
4. Drives and walks planned to encourage safe traffic habits.
5. Apparatus areas surfaced with appropriate material and landing pits with soft, resilient material.
6. Fixed playground equipment firmly set and systematically inspected.
7. Air and light free from obstruction.
8. Adequate supply of water for drinking, services, and fire prevention.
9. Can be reached by pupils without hazard.

B. Is functional and adaptable:

1. Accommodates a wide variety of activities.
2. Planned to fit both the regular school and the community programs.
3. Maximum use of space in the program.
4. Lends itself to a changing educational program.
5. Ready accessibility of facilities used by community groups, including access to toilets from outside.

C. Is economical:

1. Cost consideration (even for donated land) should include necessary expenditures for insuring a completely adequate site, with provision for possible future expansion.
2. Early purchase or option.
3. Near population center.
4. Large percentage of site usable.
5. With both topsoil and subsoil suitable for foundations, vegetation, and play areas.
6. Building design suitable for site, insuring economic maintenance and operation.
7. Building and site planned as integrated unit; for example, with service drives near storage, kitchens, shops, and stages.
8. Landscaping, sodding, and drainage covered in preliminary and final plans.

9. Multiple utilization of certain areas by both school and community.
10. Careful layout of walks and drives to obviate intersection of play areas or traffic lanes.

D. Is attractive:

1. Comprehensively planned and developed progressively to completion of original plan.
2. Suitable size and shape for setting of buildings, with adequate areas for play, athletics, walks and drives, parking, and services.
3. Slightly rolling contour, appropriately graded or terraced, sodded, and landscaped.
4. Well maintained, encouraging school-community cooperation in care and upkeep.

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APPENDIX

Sample Questionnaire

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON 25, D. C.

SURFACING PLAYGROUND AREAS

Please answer the following questions for your school system and return in the enclosed envelope.

1. Is it your board's policy to hard-surface a portion of the school grounds? Yes .... No ....

2. If the answer is yes, what areas? .....
.....

3. What materials are used on courts? .....
.....

4. What materials are used under playground apparatus? .....
.....

5. In your opinion, what are the most desirable methods for surfacing:

(a) **Courts? .....**

(b) **Areas under playground apparatus? .....**

(c) **General school ground areas, such as ball diamonds and fields? .....**
.....

(d) **For stabilizing?* .....**
.....

Reported by ....
(Title)

Address .....
(City) (State)

School system .....

Date .....

***As you know, various materials, such as asphalt, cement, resin, and rock salt, are used for binders.**

U. S. GOVERNMENT PRINTING OFFICE

RATING FORM
for
THE SELECTION OF SCHOOL SITES

H. H. LINN, F. J. McCORMICK, D. J. LEU

LOCATION OF SITE _____

SITE SIZE _____ acres

ASSESSED VALUE $ _____

APPRAISED VALUE $ _____

PRESENT OWNER _____

OWNER'S ADDRESS _____

_____

AVAILABILITY _____

_____

_____

(Insert photo of site)

RATING OF SITE

BASIC CONSIDERATIONS	IDEAL SCORE	ACTUAL SCORE	PERCENTAGE RATING 0 10 20 30 40 50 60 70 80 90
1. SIZE	400		
2. TOPOGRAPHY	250		
3. LOCATION	200		
4. COST	150		
TOTAL	1000		

GENERAL RATING OF SITE

_____

_____

_____

SCHOOL SITE RATING FORM

INSTRUCTIONS: Score items as follows: 5 = Very Superior, 4 = Superior
3 = Average, 2 = Below Average, 1 = Poor, 0 = Very Poor.
Multiply score times weight and enter result in "total" column.

BASIC CONSIDERATIONS	SCORE	WEIGHT	TOTAL	GRAND TOTAL	NOTES
I. SIZE					
1. Size		60			
2. Expansibility		20			
II. TOPOGRAPHY					
1. Elevation		10			
2. Drainage		10			
3. Soil		10			
4. Contour		10			
5. Shape		5			
6. Natural Features		3			
7. Attractiveness		2			
III. LOCATION					
1. Central Location		5			
2. Type of Neighborhood		5			
3. Zoning		5			
4. Accessibility		5			
5. Traffic Arteries		3			
6. Water Lines		3			
7. Sewers		2			
8. Electricity		2			
9. Gas Lines		1			
10. Fire Protection		2			
11. Public Transportation Fac.		2			
12. Parks and Playgrounds		2			
13. Natural Hazards		1			
14. Noise		1			
15. Odors and Dust		1			
IV. COST					
1. First Cost		10			
2. Site Development		5			
3. Building Removal		5			
4. Installation of Utilities		5			
5. Street Development		5			
GRAND TOTAL					

SCHNEIDER* SITE EVALUATION RATING SHEET

Site Desig.	Final Rating

Location _____

District _____

Local Option #1 _____

Local Option #2 _____

WEIGHTINGS	ITEMS EVALUATED															TOTAL SCORE
	Accessibility	Acquisition	Community Use	Drainage	Environment	Expansion	Population	Preparation	Topography	Traffic	Utilities	Zoning	Acreage	Option No. 1	Option No. 2	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
10																
9																
8																
7																
6																
5	CRITICAL ZONE															
4																
3																
2																
1																
0																

Date _____, 19____

Evaluated by _____

CALCULATION: A/B x 1000 = Final Rating

A. TOTAL SCORE	
B. ITEMS SCORED	

* Schneider, R. C., Consultant in School Site Problems, School Planning Laboratory, Stanford University.

Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
Bureau of School Buildings

SCHOOL SITE INSPECTION
Work Sheet

I. Location: County_____ District_____ Administrative Unit No.____

1. Name and general location of site _____

2. Site

a. Is near school population center — Yes ____ No ____

b. Is within walking distance of what per cent of pupils to be served. Per cent _____

c. Is within the following distance in miles from most distant pupils (Circle). 2 - 4 - 6 - 8 - 10 - 12

d. Is easily accessible from improved highway — Yes ____ No ____

e. Has safe means of ingress and egress — Yes ____ No ____

f. Is safe distance from:

railroads	Yes ___ No ___		Heavy traffic	Yes ____	No ____
airports	Yes ___ No ___		hazardous industrial plants	Yes ____	No ____
airways	Yes ___ No ___		unslightly or non-fireproof structures	Yes ____	No ____

g. Is well removed from objectionable noises, odors and other nuisances — Yes ____ No ____

h. Is readily accessible to:

electricity	Yes ___ No ___		fire protection	Yes ____	No ____
water	Yes ___ No ___		telephone	Yes ____	No ____
sewers	Yes ___ No ___				

General rating as to location:

Excellent _____ Good _____ Fair _____ Poor _____

II. Physical Characteristics:

a. Site is on high ground in relation to surrounding terrain — Yes ____ No ____

b. Site is:

fairly level	Yes ___ No ___		gentle slope	Yes ____	No ____
slightly convex	Yes ___ No ___		steep slope	Yes ____	No ____
slightly concave	Yes ___ No ___		abrupt slope	Yes ____	No ____

c. Site has sufficient elevation to:

avoid flooding from streams Yes ___ No ___
Permit good natural drainage Yes ___ No ___
avoid flooding from surface water Yes ____ No ____

d. Check basic soil composition

Loam _____ Gravel _____ Limestone _____
Sandy _____ Clay _____ Farmland _____
Shale _____ Rock _____

e. Check the term which best describes the site

Farm under cultivation _____ Existing building site _____
Abandoned farm _____ Old industrial site _____
Timberland _____ City or borough lot _____
Grassland _____ Reclaimed land _____

f. The site will require clearance of (Check)

Trees _____ Stone fences _____
Brush _____ Old buildings _____
Rubbish _____

g. Site shows evidence of:

soil erosion Yes ___ No ___
swampy or wet areas Yes ___ No ___
recent fill Yes ___ No ___
abandoned wells, cisterns or cesspools Yes ___ No ___
abandoned mines or quarries Yes ___ No ___
toxic gases, smoke or obnoxious odors Yes ____ No ____
active mine, gas well, oil well Yes ____ No ____
inactive mine, gas well, oil well Yes ____ No ____
High Pressure gas or oil lines Yes ____ No ____
High tension power line Yes ____ No ____

h. General Shape

rectangular (Ratio width to length not more than 3.5) Yes ___ No ___
irregular Yes ___ No ___
Approximately square Yes ____ No ____
long axis parallel to access street or highway Yes ____ No ____

i. Site can be developed without:

a large amount of fill Yes ___ No ___
retaining walls Yes ___ No ___
extensive cut, or regrading Yes ____ No ____
culverts or bridges Yes ____ No ____
extensive grouting and shoring Yes ____ No ____

j. Road systems on site can be kept within reasonable limits of economy Yes ____ No ____

k. Estimated cost of site:

acquisition $ _____ preparation to receive the building $ _____

development $ _____

III. Adequacy:

a. Total acreage in site _____ acres

b. Total usable acreage _____ acres

c. Will site provide adequate space for:

building and approaches	Yes ___	No ___	elementary play areas (3 areas)	Yes ___	No ___
Secondary play areas:					
track, football and baseball	Yes ___	No ___	parking	Yes ___	No ___
Boys' play area	Yes ___	No ___	gardens, landscaped area, etc.	Yes ___	No ___
Girls' play area	Yes ___	No ___	probable additions	Yes ___	No ___

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